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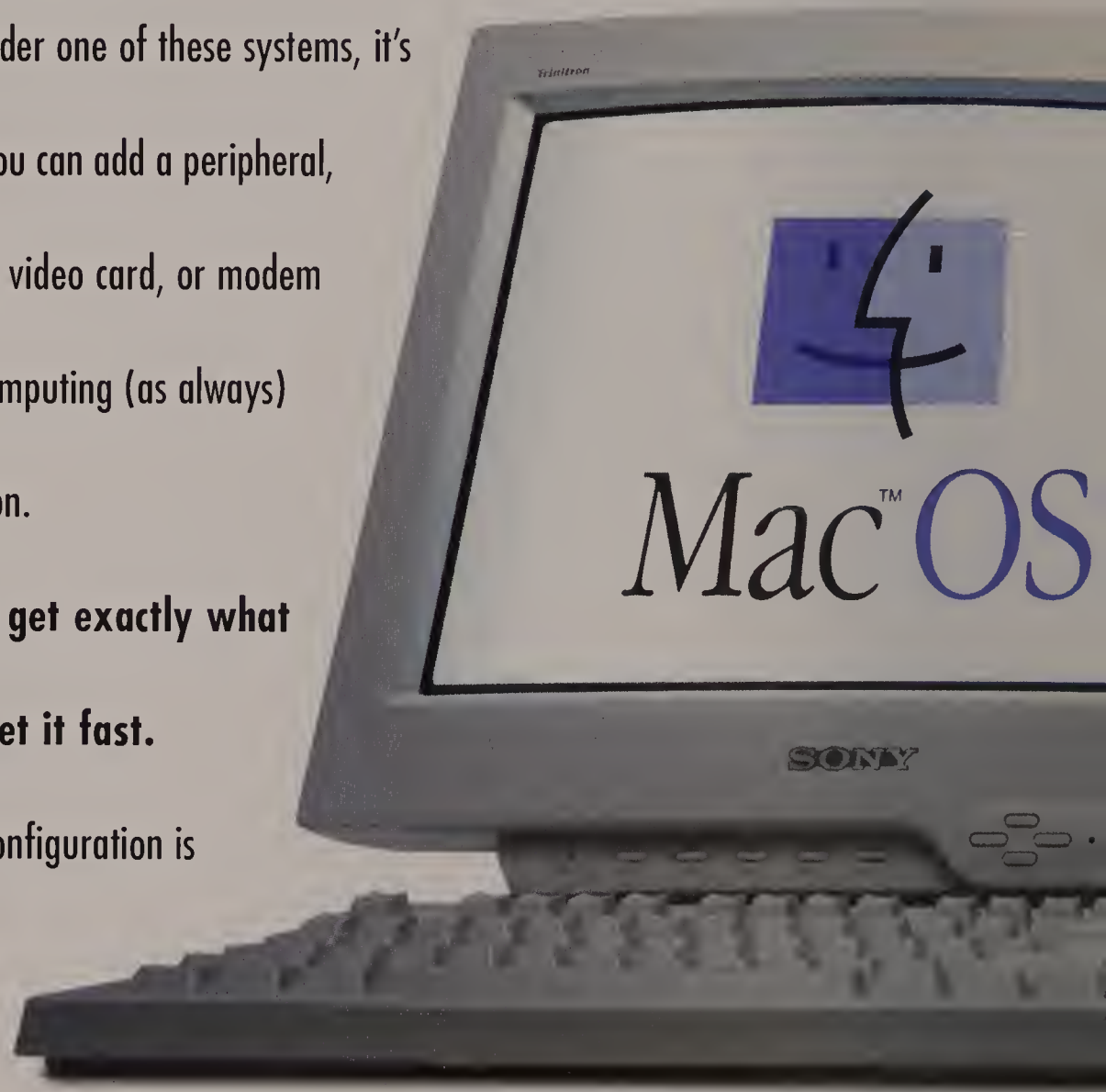

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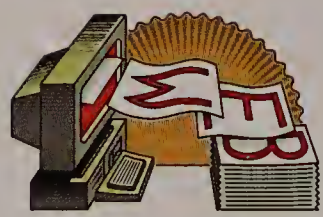

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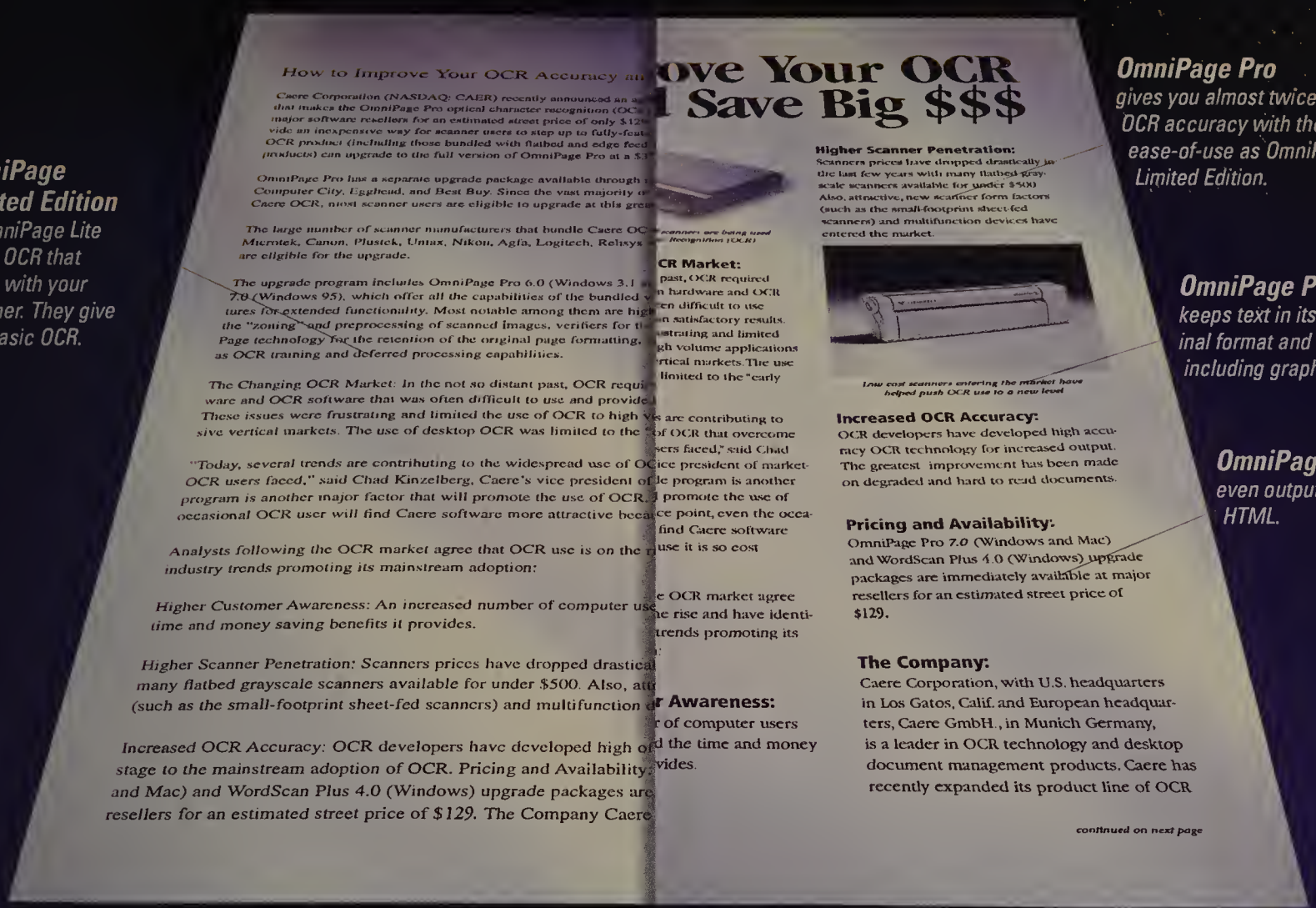

How to Improve Your OCR Accuracy an

Caere Corporation (NASDAQ: CAER) recently announced an a
that makes the OmniPage Pro optical character recognition (OC
major software resellers for an estimated street price of only $12
vide an inexpensive way for scanner users to step up to fully-feat
OCR product (including those bundled with flatbed and edge feed
products) can upgrade to the full version of OmniPage Pro at a $3

OmniPage Pro has a separate upgrade package available through
Computer City, Egghead, and Best Buy. Since the vast majority o
Caere OCR, most scanner users are eligible to upgrade at this gre

The large number of scanner manufacturers that bundle Caere OC
Microtek, Canon, Plustek, Umax, Nikon, Agfa, Logitech, Relisys
are eligible for the upgrade.

The upgrade program includes OmniPage Pro 6.0 (Windows 3.1
7.0 (Windows 95), which offer all the capabilities of the bundled
tures for extended functionality. Most notable among them are hig
the "zoning" and preprocessing of scanned images, verifiers for t
Page technology for the retention of the original page formatting,
as OCR training and deferred processing capabilities.

The Changing OCR Market: In the not so distant past, OCR requi
ware and OCR software that was often difficult to use and provide
These issues were frustrating and limited the use of OCR to high v
sive vertical markets. The use of desktop OCR was limited to the

"Today, several trends are contributing to the widespread use of OC
OCR users faced," said Chad Kinzelberg, Caere's vice president of
program is another major factor that will promote the use of OCR.
occasional OCR user will find Caere software more attractive beca

Analysts following the OCR market agree that OCR use is on the r
industry trends promoting its mainstream adoption:

Higher Customer Awareness: An increased number of computer use
time and money saving benefits it provides.

Higher Scanner Penetration: Scanners prices have dropped drastical
many flatbed grayscale scanners available for under $500. Also, att
(such as the small-footprint sheet-fed scanners) and multifunction d

Increased OCR Accuracy: OCR developers have developed high o
stage to the mainstream adoption of OCR. Pricing and Availability:
and Mac) and WordScan Plus 4.0 (Windows) upgrade packages are
resellers for an estimated street price of $129. The Company Caere

ove Your OCR
l Save Big $$$

scanners are being used
(recognition (OCR)

CR Market:
past, OCR required
n hardware and OCR
en difficult to use
n satisfactory results.
strating and limited
gh volume applications
rtical markets. The use
limited to the "early

s are contributing to
of OCR that overcome
sers faced," said Chad
ice president of market-
le program is another
promote the use of
ce point, even the occa-
find Caere software
use it is so cost

e OCR market agree
e rise and have identi-
trends promoting its
:

r Awareness:
r of computer users
d the time and money
vides.

Higher Scanner Penetration:
Scanners prices have dropped drastically in the last few years with many flatbed gray-scale scanners available for under $500. Also, attractive, new scanner form factors (such as the small-footprint sheet-fed scanners) and multifunction devices have entered the market.

Low cost scanners entering the market have helped push OCR use to a new level

Increased OCR Accuracy:
OCR developers have developed high accuracy OCR technology for increased output. The greatest improvement has been made on degraded and hard to read documents.

Pricing and Availability:
OmniPage Pro 7.0 (Windows and Mac) and WordScan Plus 4.0 (Windows) upgrade packages are immediately available at major resellers for an estimated street price of $129.

The Company:
Caere Corporation, with U.S. headquarters in Los Gatos, Calif. and European headquarters, Caere GmbH., in Munich Germany, is a leader in OCR technology and desktop document management products. Caere has recently expanded its product line of OCR

continued on next page

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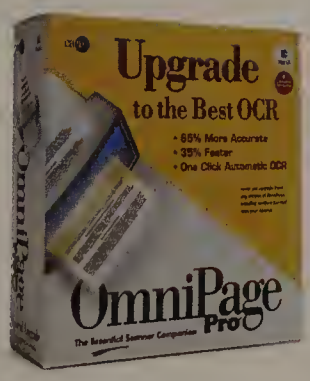

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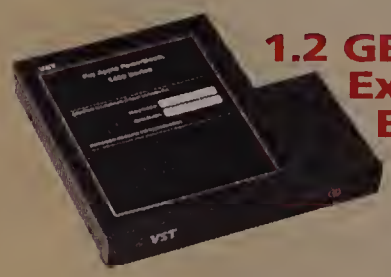

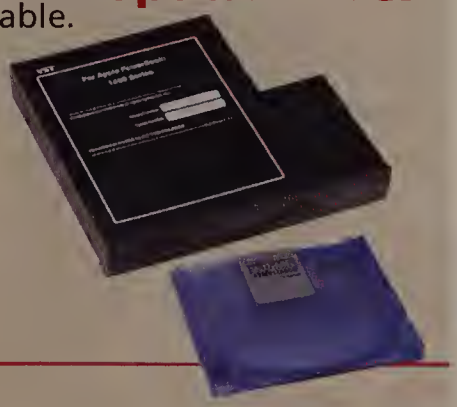

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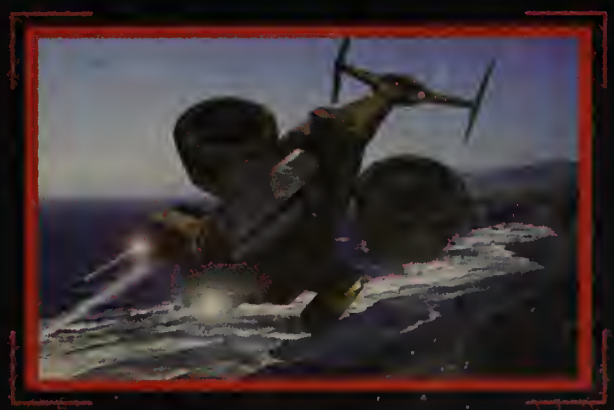

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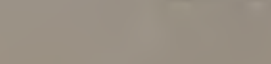

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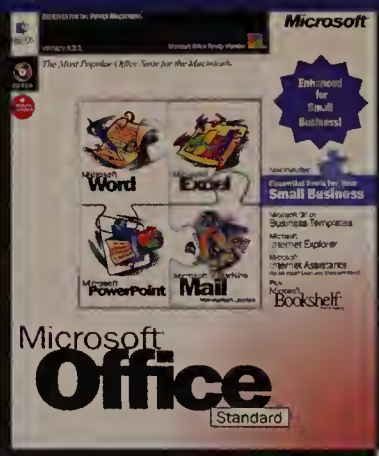

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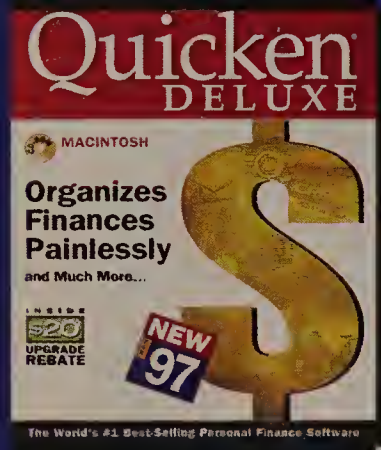

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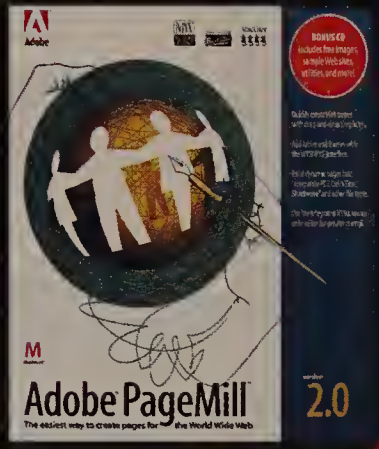

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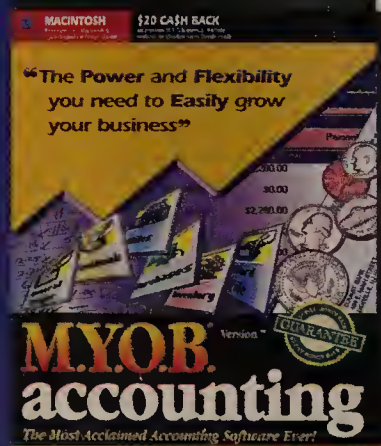

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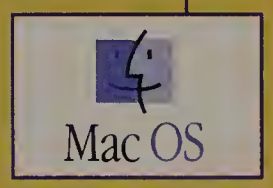

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Circle 261 on reader service card

MARCH 1997

Letters

Strong Opinions on Corel

As a graphic designer I can only echo Deke McClelland's horror at the CorelDraw 6 Suite (*Reviews*, December 1996). I'm firmly convinced that the real reason it's the best-selling PC drawing package has everything to do with the 750 fonts and 10,000 pieces of (mostly awful) clip art. It sure has nothing to do with the painful drawing tools.

If competing against Microsoft in the office-suite wars means user-interface arrogance, bloated code, and playing to the lowest common denominator, then I must admit that Corel is well on its way toward achieving its lofty goal.

Jim Donato
Orlando, Florida

How could you give the CorelDraw 6 Suite only two stars? I'm the first to admit it isn't the best set of programs and it does have its share of bugs, but look at the value. The $595 list price can be misleading, but seven pages forward in your magazine the CorelDraw 6 Suite was advertised for $415.98. And the competitive upgrade is only $158.98.

If you purchase the CorelDraw 6 Suite, you may not get the best products, but you still have money in your pocket to replace the bad portions.

Carl Grant
Sterling Heights, Michigan

I wondered what you were thinking when you went from praising to pounding the CorelDraw 6 Suite. Mike Heck wrote a glowing report of CorelDraw ("Can CorelDraw Challenge the Pros?" *News*, August 1996). I based my purchase on that "Sneak Peek," as it was the most current information.

A week later, the December issue came out. "Corel debuts on the Mac with a resounding thud." Great. I noticed, though, that the guy who reviewed it was Deke McClelland. Where was he months ago when the beta was out?

Ethan Roberts
Watertown, Wisconsin

Mike Heck, a contributing editor for InfoWorld, *stepped in and did our "Sneak Peek" on the CorelDraw 6 Suite while Deke was busy taking portraits of albino reptiles. A "Sneak Peek" is not a review. It gives a look at the features and interface of a beta product without rating or evaluating it, so Heck gave Corel the benefit of the doubt about fixing bugs. Our reviewers—like McClelland—cut companies no such slack for final products rated in reviews.—Ed.*

Where's the Bunny When You Need It?

My eternal thanks for "The Battery Time Bomb" (*News*, December 1996). A couple of months ago my daughter's LC 475 died. I assumed she'd blown the logic board until I saw your article. A new battery cost me $8. Your magazine was $5.95. Better than spending $800 for a new board, or getting next to nothing for the machine as junk. The experience left me delighted with *Macworld*, but a bit puzzled about Macintosh service. Can it really be that trained technicians don't know about this battery wrinkle?

Don Braid
Calgary, Alberta, Canada

According to "The Battery Time Bomb," the motherboard battery replacements should range in price from $7 to $15. A local repair center I spoke with informed me that my wife's PowerBook 165c has a wafer-type battery on a card soldered to the motherboard. I was told that replacing the card alone would cost $145! Is this a mistake, or did you overlook some oddities hidden in Apple's product line?

Jeff Nugent
Bonner Springs, Kansas

The cost of a PowerBook 165c battery should be no different than for other Macs—$7 to $15, as long as you install the battery yourself. Motherboard batteries are harder to replace in PowerBooks than in desktop Macs, but even so, $145 seems a high price for technical service. You might want to call around and find a better deal—something in the $80 range.—Cary Lu

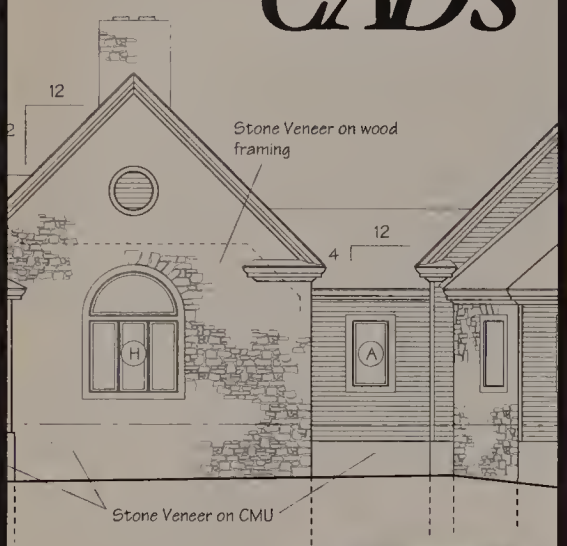
Off the Grid . . . and Loving It

Roger Spendlove's letter was of great interest, as I have been living off the grid using photovoltaic power for about 20 years (*Letters*, December 1996). The problem with computer equipment is

continues

JEFF NEUMANN

DRAW circles around those other CADs



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that there is *no* standard. I power my Power Mac, scanner, removable drives, and printers with a 12-volt battery system through a 120V AC inverter. On the DC side of my system, the PowerBook requires 24V—7.5V for the PowerBook 150—and a third printer uses 5V. Although Spendlove is willing to wire his home for DC power only, most of the people I know living off the grid find that using a good inverter and standard energy-saving 120V AC appliances and lighting saves a lot of money and headaches when providing different power for several systems. Aside from which, the cost of DC wiring is usually more than the cost of a good modified sine-wave inverter.

SAM TAYLOR
The Unplugged Unquarterly
Tres Piedras, New Mexico

Want to live off the grid? You can reach The Unplugged Unquarterly, *a journal about using, living, and working with renewable energy, at* staylor@taos.newmex.com, *505/986-2952, or P. O. Box 40, Tres Piedras, NM 87577.—Ed.*

Acronym Alert

IN "FILE FORMATS FOR PREPRESS" (*PUBlishing Workshop*, December 1996), a clarification needs to be made regarding DCS and EPS image files. High-resolution CMYK images in EPS and DCS format (the most common CMYK format in prepress) are about the same size as CMYK TIFFs—not 25 percent larger.

DARREL PLANT
Portland, Oregon

True. CMYK files are about the same size in TIFF, EPS, and DCS when saved from Adobe Photoshop, though embedded previews can make minor variations. But RGB *image files created by Photoshop are 25 percent larger in EPS format (even without previews). Photoshop's EPS files seem to include four channels of data, even though only three contain color information.*

Your mileage may vary, however, if you're using something other than Photoshop. EPS files created by Equilibrium's DeBabelizer 1.5, for instance, are 270 percent the size of their TIFF equivalents—with either RGB or CMYK images—even with no previews included.

Also note the uncertain antecedent in the sentence referring to Photoshop's screening ("One difference [between TIFF and EPS]: when you include screening instructions in a Photoshop EPS file, Photoshop's screening procedure differs from standard PostScript screening, which can reduce banding in scanned images and graduated fills"). The which *refers to Photoshop's screening, not standard PostScript screening. For an explanation of Photoshop's screening routine, see* Quick Tips, *December 1996.—Steve Roth*

Are We Mac Hypochondriacs?

I READ YOUR COMPARISON REVIEWS ON virus-protection software, and I had to laugh (*Reviews*, December 1996). Just which viruses, exactly, are these programs checking for? I have been downloading software from the Internet for several years and I can only recall one mention of a virus during this period. I know they exist, but they are very few and very far between. Word macro viruses? Yet another reason to keep Microsoft products off my computer. My advice: save your money. Macintosh users are too busy doing real work with their computers to bother writing viruses. For the PC user, however, virus protection is a way of life. We're still trying to get rid of the Monkey virus from all the PCs at my workplace.

STEVE ROSEN
Philadelphia, Pennsylvania

Maybe I download more files than you do, but my machine ends up with infected files often enough so that I've made Disinfectant a permanent resident on my hard drive.—Ed.

Unhappy with Quark

I'M A LOYAL QUARKXPRESS USER AND have been for years. However, I have no interest in using QuarkImmedia as a Web design tool, for the very reasons your reviewer thinks I should be interested (*Reviews*, December 1996).

Barbara Assadi writes as if other designers are the only audience for Web design. Perhaps this is often true; this is a rather incestuous business, even now. But as a Web designer, I know that accessibility is everything—you've got to make your pages as simple and quick as possible for the widest number of browsers. Immedia's proprietary browsing architecture defeats this goal.

Only a fraction of netizens will bother to download yet another piece of proprietary software to view a minuscule

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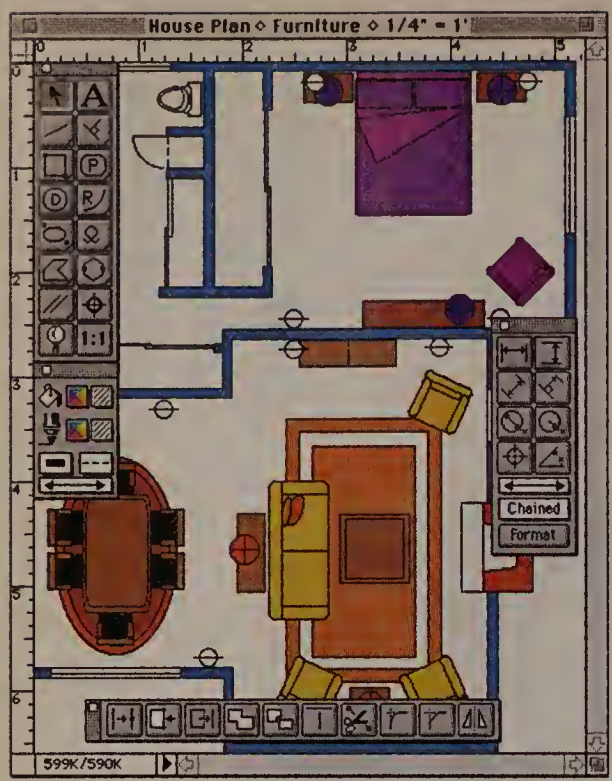

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number of pages, especially if the only benefit is really nice-looking type. (How many Adobe Acrobat pages have *you* accessed lately?) We designers often forget that outside our world, the vast majority of the real world couldn't care less about typography, as long as they can read what it says. On the Web in particular, they care about searchability and the ability to cut and paste, both of which are impossible in Immedia. Consequently, these pages, like Acrobat pages, are invisible to search engines—which is another death blow.

I am frankly upset that Quark decided to go proprietary rather than really help us out with a Quark-sharp HTML translation module. Maybe this is a great multimedia tool, but to award four stars to this product as a Web design package seems grotesquely inappropriate.

STEVE FARLEY
Tucson, Arizona

Unlucky in Lotto

IT IS A PITY THAT YOUR TOP-RATED CD-ROM drive, the Plextor-equipped La Cie 8× External CD-ROM Drive for Macintosh, is no longer available from La Cie ("CD-ROM Drives Accelerate," December 1996). It seems the drive is available only with a Panasonic mechanism. I suspect that La Cie feels like the poor fellow who has won the lottery but can't produce a lotto ticket in order to claim the prize.

FRED BRUNT
Murfreesboro, Tennessee

It's also a pity that my spiffy, new 8× CD-ROM drive, purchased the week before I wrote this response, will be replaced on retailers' shelves with 16× CD-ROM drives by the time you read this. But that's the nature of the business, according to La Cie. CD mechanisms are replaced by newer mechanisms at the rate of three or four per year—*the Panasonic 8× that replaced the Plextor 8× tested in "CD-ROM Drives Accelerate" will only be around for a few months before it too is replaced with a faster drive. And then there's always DVD, due out next year.—Ed.*

A Stitch in Time

I HAVE BEEN LOOKING FOR A DECENT Macintosh needlepoint and cross-stitch program for some time. I use several PC programs under Insignia Software's SoftWindows 95, but navigating within the Windows environment is terribly awkward, and I'm not getting the results I need. Do you have any information on needlepoint or cross-stitch programs written for the Macintosh?

BERNARDINE DODEK
via Macworld Online

Yes, indeed. Try Cochenille Design Studio's Stitch Painter. You can reach Cochenille at 619/259-1698 or via its Web page at http://www.cochenille.com.—*Ed.*

Next, Macintosh Sea Chanteys

AS I SANG THE CAROLS IN "THE *MACworld* 1996 Holiday Sing-along Songbook" (*The Desktop Critic*, December 1996) aloud to my wife, I realized that those seasonal hymns prove nobody else is even half as hooked on the Mac as David Pogue appears to be! *Macworld* should be proud to have such a dedicated lunatic on its staff.

STEVE SCOVILLE
Encinitas, California

I ENJOYED DAVID POGUE'S CHRISTMAS carols so much that I was inspired to try my hand at composing one.

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J. MICHAEL ROWLAND
Thompson Station, Tennessee

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Microsoft Internet Explorer 3.0 for Macintosh. Does Netscape come with an uninstall program?

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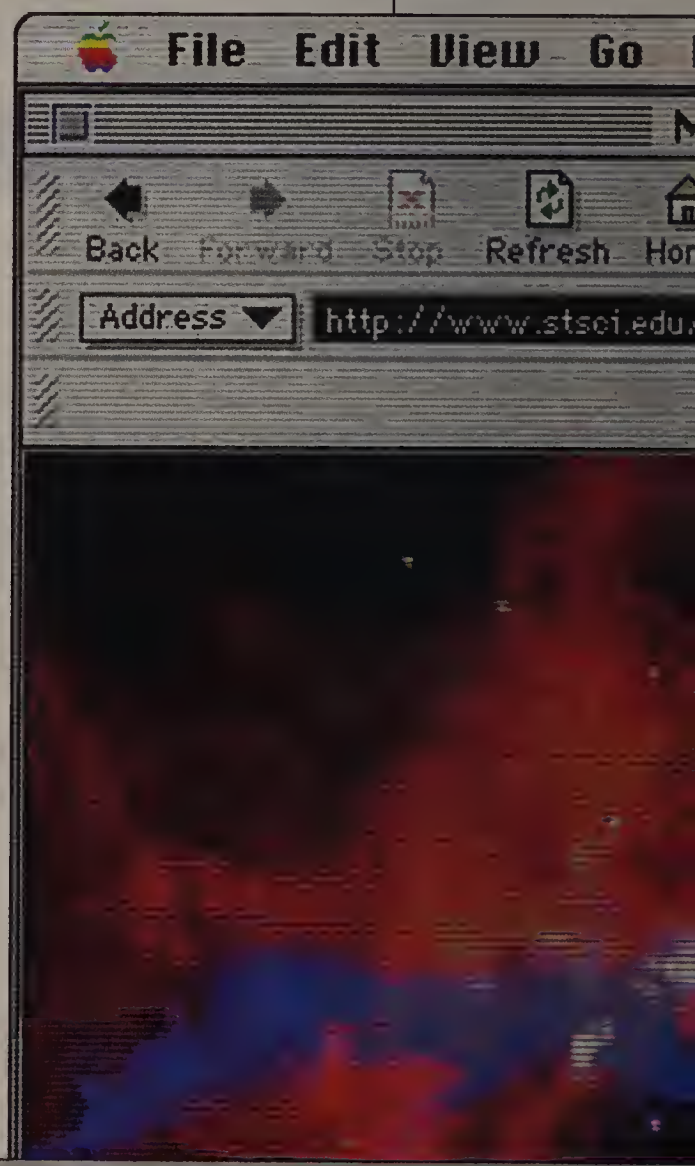

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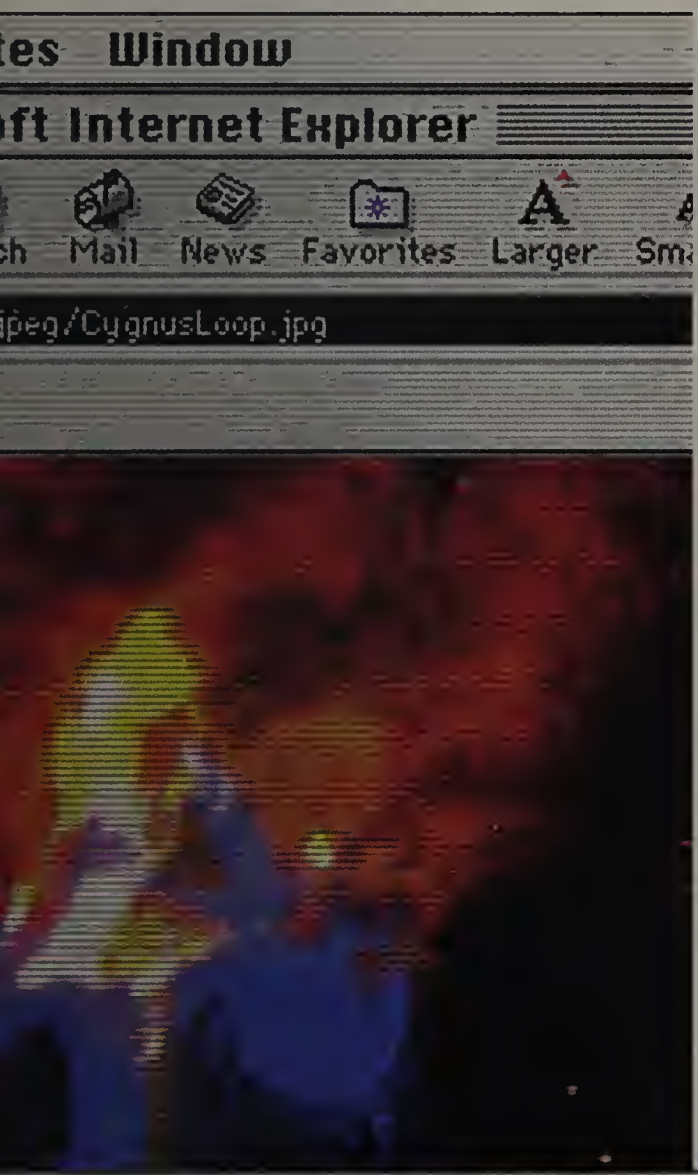

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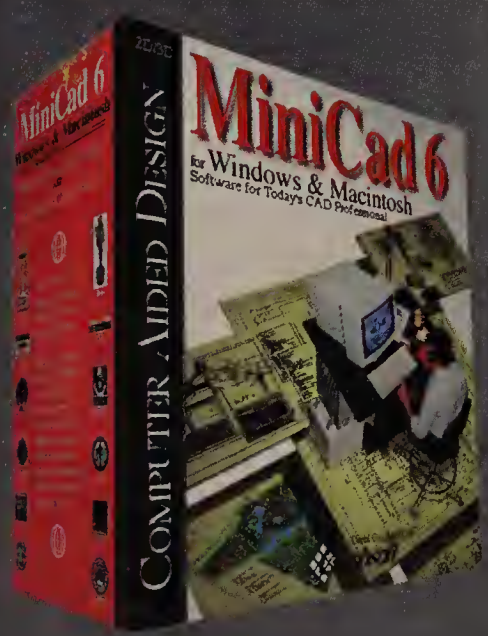

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Circle 46 on reader service card

by Adrian Mello

Steve Jobs, Next, and the Mac OS

DRAMA, QUESTIONS, AND TENTATIVE ANSWERS ON APPLE'S NEW OS

YOU CAN'T SAY APPLE isn't an interesting company. Apple's history is more like a soap opera than a corporate biography. In the previous episode viewers were anxiously awaiting the acquisition of Be so that Apple could lay claim to a new operating system to replace the recently failed Copland OS. Be is the brainchild of Jean-Louis Gassée, the onetime Apple bad boy who filled the personality vacuum created by Steve Jobs when he left the company in 1985. But at the eleventh hour, none other than Steve Jobs himself returned to Apple, and with him came Next, which will provide the Mac's new operating system and future hope.

As remarkable as Steve Jobs's rejoining Apple may be, the most important part of the story is the acquisition of Next and its technology (see "What's Next for the Mac OS?" in News). What does this mean to ordinary users? Well, it means nothing for a while, since the Next OS won't be available for at least a year. Nonetheless, the Next acquisition is important to everyone who cares about the Mac and Apple's future. Apple has placed its bet, and the company's future depends on how it plays its new hand. It's pretty clear that Apple's plans are still in the formative stage, and I don't expect to see a lot of details in the January 7 announcement.

I will tell you frankly that I don't have answers to many pressing questions as I write this, shortly after the acquisition was announced in late December. However, I can suggest some of the key questions you will be asking in the coming months, and take a jab at possible answers.

How important will Steve Jobs be to Apple? He will play a comparatively minor role as a part-time technology consultant. He won't be running the company as he did in the past. Ellen Hancock will remain firmly in charge of Apple's technology direction. The fact that Amelio has taken advantage of Jobs's publicity value to create new excitement demonstrates the kind of media savvy that's been lacking since Jobs left.

Will the new user interface look like the Mac or the Next OS? No one knows. I hope that rather than arguing which of the two existing user interfaces it should keep, Apple creates an elegant interface that makes the new OS as accessible and intuitive as possible. This interface should also do a good job of integrating the Internet.

HANK OSUNA

Will Mac technologies such as QuickTime, QuickDraw GX, and OpenDoc be incorporated into the new OS? A version of QuickTime already runs on Next for movie playback, and other pieces are likely to be integrated over time. The fate of GX, OpenDoc, and other technologies isn't clear.

Will Next technologies such as Nextmail, NextTime, and Display PostScript be incorporated into the new OS? I don't know. Apple rejected Display PostScript for QuickDraw GX several years ago, but it will probably reconsider such technology options at this point.

Will the new OS be offered on Intel-based hardware? Next says this is a possibility, and it's tantalizing. The opportunity to expand the Mac's market share into the huge base of Intel computers would be a boon and would also encourage developers. However, Apple won't want to cloud its commitment to PowerPC, so I don't expect to see an Intel-compatible version of the new OS for at least a year or two after it is available on PowerPC hardware, although OpenStep is already available on Intel machines.

Will the new OS run on my old Mac? Apple expects the new OS to run on existing Macs. It's not clear whether it will run on older PowerPC systems that use the NuBus or on even older 680X0 Macs.

Will current Mac applications run on the new OS? I find it hard to imagine that Apple wouldn't offer some form of compatibility for existing Mac applications. What degree, and what approach Apple will take, were unclear at press time. At least two products have been created that run some Mac apps on Next systems: Daydream from Quix and Executor from Abacus Research Development.

Will existing Next applications run on the new OS? This isn't clear either, but the stakes aren't as high for Apple with current Next users as they are with the vastly larger installed base of Macintosh users.

These are just a few of the questions for the new year. If you have answers, and even other questions, I'd love to hear from you at *mello@macworld.com*. In the meantime, I'm encouraged to see Apple acting boldly, and the new year looks promising indeed. It will certainly be exciting. m

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Circle 59 on reader service card

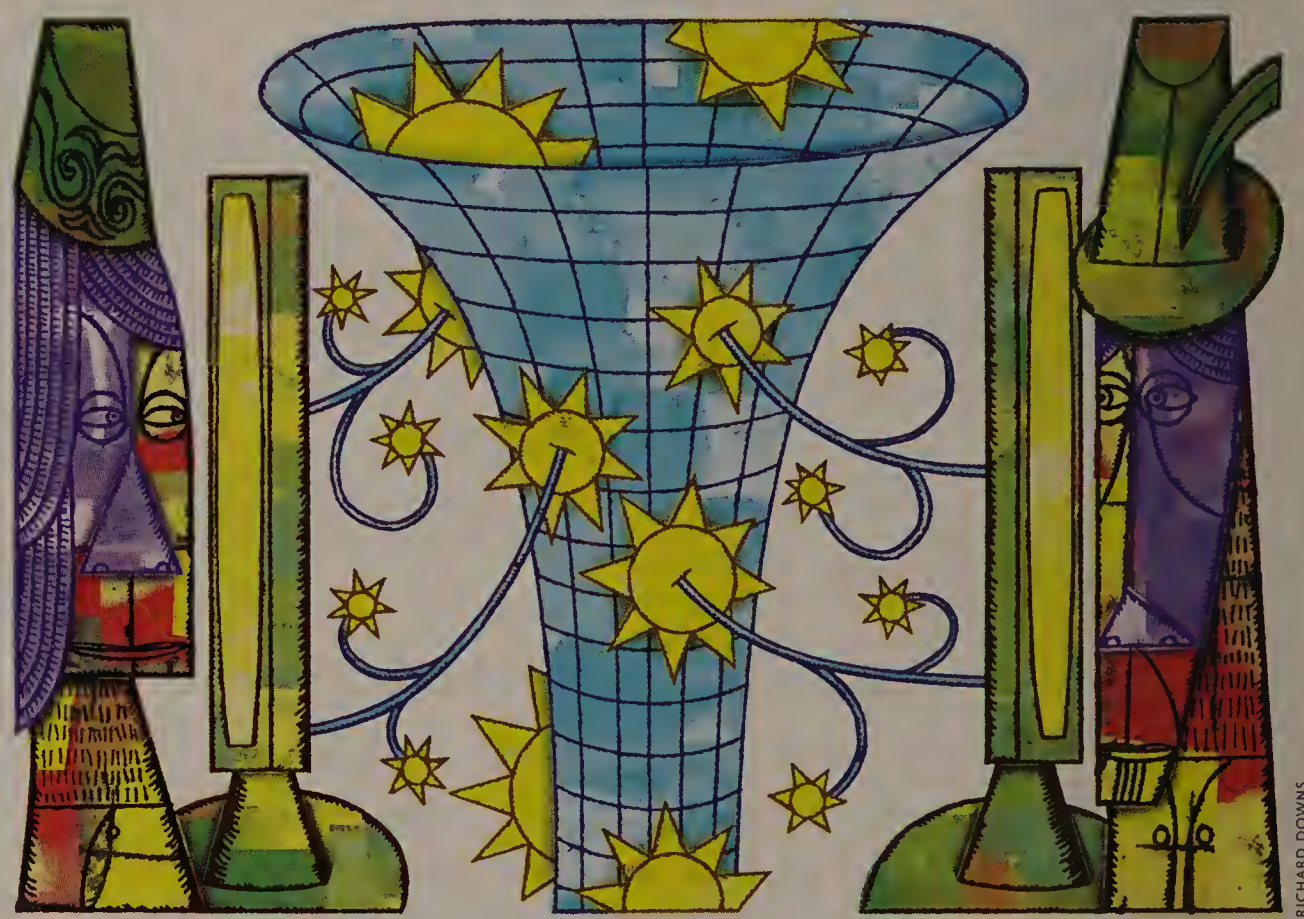
News

NEWS FLASH

What's Next for the Mac OS?

APPLE'S OS STRATEGY BEGINS TO TAKE SHAPE AS NEXT GETS ABOARD

by Tova Fliegel and Galen Gruman



RICHARD DOWNS

When Apple CEO Gilbert Amelio revealed Apple's $400 million Next acquisition in late December—along with the return of cofounder and former Next owner Steve Jobs—he offered few details about how Apple would incorporate the Next OS (known as both NextStep and OpenStep) into its product line. Those details, he promised, would be presented during his Macworld Expo keynote on January 7. Instead, the keynote turned into a high-tech Hollywood spectacle complete with movie stars and rock musicians, but with little of substance for users or developers looking for details on Apple's latest OS strategy.

In fact, Apple does have a real strategy for developing the next-generation Mac OS. Although Amelio didn't describe it, chief technology officer Ellen Hancock did in a separate press conference, and *Macworld* has learned further details. The plan has two components: a short-term strategy for issuing semiannual updates to System 7, and a long-range plan for incorporating the Next OS.

In keeping with Apple's musical metaphors, the Next-based Mac OS will be codenamed Rhapsody. Apple plans to deliver an early version of Rhapsody to developers in the third quarter of this year. This version will not run current Mac applications; the idea is to give vendors a head start on developing applications for the new OS.

Users will get their first taste of Rhapsody around January 1998, in a version dubbed Rhapsody Premier. That release will run new Rhapsody applications, but will offer only limited compatibility with System 7 applications. The first fully Mac-compatible release, Rhapsody Unified, is slated to appear in mid-1998, or possibly later.

Apple will continue to revise System 7. In July, it will ship the Tempo upgrade (see "The Mac OS's Interim Steps," elsewhere in this section). In January 1998, Apple plans to ship the Allegro update, and in

July 1998, the Sonata upgrade. The two updates' features are still being determined.

Apple expects to support both System 7 and the new Mac OS for several years, even after Rhapsody ships to the public.

With this new scheme, Apple is throwing away several years of effort spent developing an OS that can run Mac OS 8 and System 7 programs using shared OS components. But Apple says it will port current key Mac technologies like QuickTime, AppleScript, Apple events, V-Twin, HotSauce, Open Transport, and OpenDoc.

System 7 Compatibility

Apple plans to develop a compatibility box for the Next-based OS that will let it run most System 7 programs. The so-called Blue Box will not be a Mac emulator but the actual System 7 OS running on the new Mac OS kernel, the part of the OS that manages hardware and basic system operations. Apple has not decided what kernel to use, and before being acquired by Apple, Next was thinking of using a new version of its Mach kernel.

In the Blue Box window you will be able to run any System 7 program (680X0 and PowerPC) that doesn't communicate directly with the Mac hardware. The programs that do run will include system extensions and control panels, but not drivers and some utilities that work directly with the hardware. This level of compatibility is more than was planned for Apple's original Mac OS 8 effort, known as Copland. That OS would not have run extensions and control panels.

Technologies such as QuickDraw 3D, QuickTime, QuickDraw GX, OpenDoc, and the DayStar multiprocessing API will also be supported in the Blue Box.

The Next-Based Mac OS

The new Mac OS—the Next-based OS—will be known as the Yellow Box. Unlike Copland, the Yellow Box will be fully preemptive and multithreaded, and will have full memory protection. This means programs can work in parallel without causing each other to crash. It also means users should be able to run several tasks in parallel, such as faxing while printing, or doing a database sort while reading e-mail. Under the Copland plan that Apple killed in August, only some parts of Mac OS 8 would have had these capabilities.

Rhapsody's Yellow Box will also support fully symmetrical multiprocessing, in which any available CPU can run any program or program thread. System 7's multiprocessing architecture reserves one CPU as the traffic cop, which divides the tasks of programs specifically written for multiprocessing among the available CPUs. The primary CPU is less available for task sharing because of its role as traffic cop.

Mac-Like Interface

Apple plans to rework the Next OS's interface so it is Mac-like. While Apple will adopt some Next OS conventions, the company is convinced that the Mac OS's human interface is the best available and wants to ensure this approach is maintained. Within the Next-based OS, Apple will hide the remnants of its Unix command-line interface.

Like the abortive Copland effort, the Next-based Mac OS in the Yellow Box window will support multiple looks. Thus, you will be able to customize the interface's visual appearance and how some of its features operate—for example, preventing network access for some users.

continues on page 42

LEA SUZUKI/SAN FRANCISCO CHRONICLE

Steve Jobs got all the attention, but the real story is Next's software technology.

NEWS FLASH

Apple Eyes Java for Key OS Role

THE MAC OS MAY GET AN ASSIST FROM SUN

by Charles Seiter

Java is emerging as the language of the Internet, and Apple has been forced to find a place for Java in its ongoing OS revision struggles. Apple's chief technology officer Ellen Hancock, an admitted Java fan, has said that Apple is using Java for elements of Mac OS 8, and hopes the company can integrate some Java components developed by other companies into the operating system, saving Apple the time of developing these components.

In fact, Apple is generating a wide range of responses to the rise of Java as a programming language. At the simplest level, Apple has announced that Mac OS Runtime for Java 1.0 will ship this spring and be included in the Harmony OS in July, allowing Java applets to run on a Mac without opening a separate browser. At the most advanced level, Apple is said by contacts at language vendors to be contemplating a stripped-down future operating system written in Java itself.

PowerPC Goes Java Such an operating system would be an ideal match to the CPU quietly announced in spring 1996 by Motorola. Hans Wildenberg, director of Motorola Semiconductors Europe's computer technology group, described plans for a chip Motorola intends to introduce in early 1997, a custom PowerPC 604 processor optimized for Java instructions, which would be essentially a PowerPC alternative to Sun Microsystems' own Java chip set, which was

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also announced in 1996.

In between these two options, or perhaps waiting at the side, is a Pippin-like operating system supporting OpenDoc and Java, which Apple is said to be positioning as a competitor to Sun Microsystems' JavaStation, a "thin client" network computer introduced in late 1996. Thus, at the simplest level, a user wouldn't really have much more Java involvement than happens now when running Netscape Navigator 3.01 under System 7.5, while at the advanced level the Mac would be an all-Java system, running new, network-oriented, OpenDoc- and Java-based software—not Mac software. This would be a radical new generation of Macs. Sources close to Apple deny that there is a plan to replace the Mac OS with a Java-based OS, but acknowledge that Apple is exploring ways to use Java throughout its products.

Will Java Be True? One reason for Apple's cautious, multilevel approach to Java is major uncertainty about aspects of Java's future. Java was designed by Sun as a cross-platform language, and Sun's JavaSoft subsidiary is trying to get the programming industry to accept the idea of Pure Java, a platform-independent version credentialed by a large test suite.

But Microsoft is putting considerable effort into derailing Java—first, by promoting its own ActiveX system as an alternative for Internet programming, and second, by insisting on Windows-specific additions to basic Java so that most programmers' work wouldn't run on Macintosh or Unix systems.

Apple clearly doesn't want to get caught with an all-Java hardware-and-OS base if Microsoft can succeed in undermining Java as a cross-platform programming system. Therefore, Apple must keep its options open on Java involvement for at least another year.

The Java Trial However, the situation may not be as difficult for Apple as it seems at first. Because Java-ready browsers for both 680X0 and PowerPC systems already exist, the whole Apple installed base has a chance in 1997 to investigate small, fast OpenDoc and Java applets as possible replacements for the giant traditional applications that form the Microsoft-dominated view of computing.

Before committing themselves to next-generation hardware and a new Mac OS, owners of older Macs would still have the opportunity to try—at considerably reduced performance in a browser window—some of the new applications and applets written in Java that Apple thinks may be a market force driving users to a new platform.

systems

IBM, Motorola Drop NT for PowerPC

TOO LITTLE DEMAND, TOO FEW PROGRAMS

by Tova Fliegel

The PowerPC has lost another operating system, leaving the Mac OS and IBM's AIX version of Unix as the only major OSs on it. (IBM dropped OS/2 a year ago.) IBM's RS/6000 Group (800/426-2255, *http://www.rs6000.ibm.com*) and Motorola's Computer Group (800/759-1107, *http://www.mot.com/computer/*) are halting further development of PowerPC-based Windows NT workstations. The move came a mere month after Motorola was to begin manufacturing its PowerStack II line of PowerPC-based NT workstations. Motorola says it will continue to sell PowerStack II systems, although it plans to shift production to its new StarMax series of Macs, which are produced on the same assembly lines.

Pentium Wins The two companies say there is insufficient demand for such systems and insufficient support from software developers, who would have to recompile their NT applications to run on a PowerPC-based system. Instead, it's clear that NT users have adopted Pentium Pro–based systems as the standard NT workstation. Both companies will continue to support systems ported to 4.0, the current version of NT, but neither has plans to support future versions.

CHRP in the Lurch? The announcement does not bode well for the future of the Common Hardware Reference Platform (CHRP). Capable of running the Mac OS, NT, and AIX, CHRP systems were supposed to appeal to budget-conscious corporate IS managers who could buy one machine to run multiple operating systems and save money on peripherals by connecting the same devices to machines running disparate OSs.

Now, the only major operating system to run on the forthcoming CHRP system is the Mac OS, so the only broad advantage of CHRP seems to be the lower manufacturing costs (due to CHRP's use of less-expensive PC components) for systems makers and lower costs for users who can buy PC peripherals for their CHRP Macs.

Minolta's Detachable Lens

NEW CAMERA ALSO FEATURES LCD MONITOR

Now that there's a glut of consumer-level digital cameras on the market, vendors are scrambling for new ways to differentiate their products. In the new Dimage V from Minolta (201/825-4000, *http://www.minolta.com*), the big selling point is the 2.7× zoom lens on a rotating mount, which lets you shoot from various angles without contorting yourself. You can even detach the lens and connect it to a 3.3-foot cable for shooting where no digital camera has gone before. The camera also features a color LCD monitor and built-in flash. Maximum resolution is 640 by 480 pixels, and removable cards can store 16 high-resolution or 40 low-resolution images. The camera is bundled with Adobe PhotoDeluxe 1.0 and includes Mac-compatible image-capture software that can be used as a plug-in or stand-alone application.—STEPHEN BEALE

ROBERT PERRY

Representatives of the Apple, IBM, and Motorola alliance claim that the original multi-OS benefits of CHRP remain. They claim that other as-yet-unnamed companies are preparing to announce NT ports for CHRP systems, but it's hard to imagine why any smaller companies would be willing to undertake a proposition considered too risky by the two major players.

Apple spokeswoman Nathalie Welch says Apple's plans for the CHRP-based systems will not be affected by the Motorola-IBM announcement, although she offers no timetable for their release. "After Windows NT 4.0, we'll see if there's enough customer demand or if it's time to go back to the drawing board," she says.

One rumor is that Microsoft demanded huge fees for further ports of NT on PowerPC. However, *Macworld* could not confirm that rumor.

NEWS FLASH

The Next Step: Evangelize Developers

EARLY SIGNS ARE POSITIVE

by Tova Fliegel

Developers and analysts seem to agree on one aspect of Apple Computer's surprise acquisition of Next: this time around Apple has shown some marketing smarts in spinning the tale of its returning prodigal son, Steve Jobs.

But with that marketing triumph under its belt, Apple now must ensure that a Next-based Mac OS gathers critical mass in the market. And to be accepted by consumers, Apple's new OS must first be embraced by software developers, who have limited resources to spend on porting applications, particularly in a market where a dual-platform strategy is now key to survival. As analyst Michael Gartenberg of the Gartner Group puts it, "The toughest job here is for Guy [Kawasaki, Apple evangelist] and Heidi [Roizen, head of Apple developer relations]. They still have to convince developers to buy into this."

The Benefits of Age

While praise is far from unanimous, at this still-early stage in Apple's new OS plans, a sampling of developers is applauding Apple's bold acquisition. The developers view the ten-year-old NextStep as a mature operating system with all essential services in place, dismissing remarks that NextStep is old and comparing it favorably to Apple's other options (see "Time for a New OS?" February 1997).

"It may be ten years old," says Larry Zulch, president of Dantz Development, "but it's newer than Windows NT or 95, or just about any other OS. And developers are inherently conservative. We want a stable foundation, but we have to have services that facilitate things we want to do."

Zulch and others view NextStep as just such an OS: proven as well as forward-looking. They welcome the addition of preemptive multitasking and protected memory to the Macintosh environment, features they acknowledge as long overdue.

More important, these developers say NextStep is more forward-looking than Windows 95, because of its object orientation. One developer called Next's development tools "second to none."

Steve Guttman, vice president of marketing for Fractal Design, touts Next's use of Adobe Systems' Display PostScript, which provides a more WYSIWYG display, as a boon to publishers.

These users would benefit from Display PostScript's wealth of services, Guttman says, while developers would no longer have to re-create code for output both to screen and to PostScript-based devices.

Dumping GX?

To adopt Display PostScript, Apple would have to dump its latest imaging engine, QuickDraw GX. But few developers are writing to GX, and if Apple were to adopt Display PostScript, the platform might even benefit from the promotion of an industry-standard imaging technology.

Developers and analysts agree on at least one other point: the biggest issue for Apple at this juncture is the migration path it provides. If Apple can provide a smooth transition from System 7 to this new OS—duplicating the successful transition from 680X0 to PowerPC machines—it will carry both its developers and users forward.

KEVIN CANDLAND

A Mac for Disabled People

The Macintosh has long been the favored platform for computer products aimed at people with disabilities. But until now, there has never been a Mac designed from the ground up for these special users. The Freestyle from Assistive Technology (617/731-4900) incorporates a PowerBook motherboard with a touch-screen display, infrared controls, a 6× CD-ROM drive, 16MB of RAM, and a 750MB hard drive. It also features a sophisticated text-to-speech system. Styled by Frogdesign, it looks more like a tablet than a laptop: there's no cover and no built-in keyboard, although the latter can be added as one of several input options. One advantage of this design is that the Freestyle can be easily attached to—and powered by—a wheelchair. The system includes Knowledge Navigator, an authoring tool that lets users create custom environments for disabled people. Freestyle is available at an introductory price of $4995 until June 30, after which the price will rise to $5495.—STEPHEN BEALE

NEWS FLASH

Mac OS 8's Tortuous Journey

YEARS OF DEMOS AND PROMISES BUT NO OS

by Galen Gruman

For at least five years, Apple has been talking about its big new operating system that would redefine personal computing. In those years, there have been many demos and many code names, but no new OS—at least not from Apple. Microsoft has revised Windows and Windows NT twice each in that period, while IBM has revised OS/2 twice, as well. Apple did deliver System 7.5 and some good extensions like QuickDraw 3D and QuickTime VR, but no new OS.

The following timeline charts Apple's troubled OS course to show what themes have remained and what have turned out to be mere fads. It also reminds us all that the current plan may in the end be no more successful than the many that went before it.

Pink In 1989, Apple first discussed the Pink project, which would become the next Mac OS (presumably Mac OS 8, as System 7.0 was far along in its development). Then, in 1991, Apple announced that IBM had bought into Pink and the two companies had spun Pink out as a new company named Taligent that would create a new OS for use on Apple and IBM systems, as an alternative to Windows. Instead, Taligent mutated from an OS into something that not even the Taligent staff could quite describe, and in 1995, Apple and IBM pulled the plug after wasting tens of millions of dollars.

Copland 95 In 1993, Apple started hinting about Copland, the new Mac OS that would outpower the new Windows, then known variously as Chicago and Windows 4.0. But Apple would only hint—when pressed for details, Apple spokespeople said that they didn't want to reveal anything because they feared Microsoft would steal the ideas for Chicago.

But in January 1995, after an unflattering story in *Macworld* ("The New Windows Threat," February 1995), Apple officials began releasing a few details, following up with high-profile demonstrations at the May Worldwide Developers Conference (see "The New Mac OS Unveiled," July 1995). The idea was to give the Mac community something to look forward to in the blitz leading up to and following the August 1995 release of Windows 95.

The essential features were a customizable interface, agents that automated common tasks, partially protected memory and multitasking, and a new kernel that would keep extensions from crashing the Mac (and that would make most current extensions incompatible with Copland).

Apple also described a post-Copland OS, called Gershwin, that would offer such features as preemptive multitasking and protected memory, which Copland would implement only partially. Gershwin would bring the Mac OS up to par with Unix, Windows NT, and OS/2, at least at the core OS level.

In the next year, Apple trotted out demos of Copland at various trade shows, but no one was allowed to try it themselves. *Macworld* acquired a summer 1995 prototype version of Copland and found it almost nonfunctional, despite Apple's claims that Copland would ship in summer 1996.

Apple officials gave contradictory release dates for Copland as it became obvious that a summer 1996 release would not happen. After a few months of that, it was clear that early 1998 was a more likely release target.

In August 1996, Apple was poised to announce the first developer release of Copland (called DR1), months after it was originally promised. A week before the Macworld Expo in early August, Apple officials were prepping the press and developers for the DR1 release.

By the Expo itself, DR1 was dead, as *Macworld* exclusively reported. Apple's new chief technology officer, Ellen Hancock, had realized that the Copland effort was so out of control that it could not be salvaged, and rather than let it continue, she ended it (see "Mac OS 8's About-Face," *News*, October 1996). The cost of this abortive effort: $300 million.

Copland 96-A The new plan, issued just after the demise of Copland 95, described a phased-in Copland (see "Mac OS 8: Back to Square One," November 1996). Instead of an all-new operating system, Copland features would appear over time in System 7; which features remained unstated.

At some point, System 7 would become Mac OS 8—likely when the new kernel was added—but most of the planned Copland technologies would be grafted onto System 7, so they would remain compatible with many 68030-based and all 040-

A Signature for CD-R

FARGO'S LATEST PRINTER PRODUCES CD LABELS

Recordable CD drives let ordinary Macintosh users produce their own CDs, just like the big record companies and multimedia publishers. The only problem is that the CDs look unprofessional when you label them with a felt-tip marker. So Fargo Electronics (612/941-9470, *http://www.fargo.com*) has stepped into the breach with the Signature CD Color Printer. Priced at $1295, the Signature uses thermal ink-jet technology to produce color images on CD-R media covered with a special coating. The program can also print on jewel-box enclosures and cardboard templates; the latter let you produce test prints before printing your artwork on a CD. You can print at 300 dpi or 300 by 600 dpi in color or in black and white. Signature CD-R discs, available in white or silver, cost $47.50 for a package of 5 or $475 for a package of 50. —STEPHEN BEALE

SUZANNE ROADY

based Macs, as well as with all PowerPC-based Macs. By contrast, the use of a new kernel in Copland 95 meant that only PowerPC-based Macintoshes would run Mac OS 8.

The Copland 96-A strategy survives in the semi-annual OS updates—System 7.6, Tempo, and so forth—which will continue until Mac OS 8 ships.

The Be Interlude At the August 1996 Expo, Power Computing showed off a new OS running on its Mac clones: the Be OS developed by a group of former Apple OS engineers. Apple was indeed talking to Be about an acquisition or technology-sharing arrangement. But Apple declined to comment, letting the rumors take on greater believability. By November, strategic statements and leaks from Power Computing and Be to the business and trade press resulted in a flurry of stories predicting that Apple would use the Be OS as the new Mac OS—*Forbes* and *MacUser* were among the publications proclaiming this. After a month of this, Apple began quietly spreading the word that there'd be no Be acquisition.

Copland 96-B To debunk the Be OS rumors, sources close to Apple described a new variation on the Mac OS 8 strategy in late November. Under that strategy, Apple would have a fat OS, in which System 7 and Mac OS 8 components would coexist, much like fat-binary programs let 680X0 and PowerPC components coexist. System 7 programs would use System 7 OS components, and Mac OS 8 programs would use Mac OS 8 components (see "Time for a New OS?" February 1997).

But a month later, in late December, Apple announced the Next acquisition and yet another new OS strategy. Let's hope this one sticks.

NEWS FLASH

The Mac OS's Interim Steps

PERFORMANCE BOOSTS AND WEB INTEGRATION

by Galen Gruman and Adrian Mello

Until the Next-generation OS is ready, Apple will continue to release interim updates to System 7. Following this month's System 7.6 release (known for months by its code name, Harmony) will be a July release of the Tempo System 7.X OS, incorporating features of the Mac OS 8 Finder.

With this new scheme, Apple is throwing away several years of effort developing an OS that can run both Mac OS 8 and System 7 programs using shared OS components. In the Next Mac OS, developers and users will probably have to say good-bye—at least for a few years—to some of Apple's more elegant technologies, such as QuickTime. But what Apple bought in exchange could be new life for the Mac OS, albeit in an entirely different form.

Before the world knew of Apple's acquisition of Next, Apple CEO Gilbert Amelio personally demonstrated the mid-1997 Mac OS update, code-named Tempo and likely to be called System 7.7, to the press in mid-December.

Tempo is the first major revision to the Mac OS since System 7.5. The System 7.6 release in January merely bundled bug-fixes; enhanced virtual-memory management; and previously released revisions to QuickDraw 3D, Cyberdog, and OpenDoc into System 7.5.5. It also added a

continues

Internet WATCH

BY CAMERON CROTTY

Microsoft and Netscape's New Battle

You'd better be ready for the Internet to invade your desktop, because it's now just a question of which company will burst onto your screen first, Netscape Communications (415/254-1900, *http://www.netscape.com*) or Microsoft (206/882-8080, *http://www.microsoft.com*). Netscape's recently announced Constellation, an add-on technology for the next version of Netscape Communicator, takes over your desktop and turns it into a Net information center by using JavaScript and HTML on the client and server. Microsoft's Active Desktop follows a similar route but relies on ActiveX components to do the job.

Netscape Constellation Called the Home Port, Netscape's Constellation user environment divides your desktop into three major sections. Messages, information broadcast from the Net, and commonly used desktop resources such as applications and files appear in Project areas, which take up most of the desktop. At the bottom of the screen, the Info Stream is a strip of graphical Info Blocks, which serve as launching pads for services on the network. Suppose you've installed an Info Block for your favorite Net search engine. Instead of surfing to the search page, type your search criteria into the block and click on the Search button. Finally, the Selector bar on the right side of the screen contains the system resources (hard drives and printers, for instance) available to whoever's logged in. Constellation will require the next version (4.0) of Netscape Communicator, which comprises the company's group of Net applications (including Navigator). Netscape expects to have a public beta of Communicator 4.0 for the Mac by May.

Microsoft Active Desktop Microsoft's Active Desktop is expected to be similar to Constellation, although details of the Macintosh implementation of Active Desktop remain sketchy, partly because at the time this story was written the Mac version of ActiveX had only just entered public beta testing. Users will be able to access their file systems with Internet Explorer, using Microsoft's ActiveX component-software technology to deliver information directly to the desktop in much the same way that Netscape intends to do with Constellation. At any rate, neither company seems to be far enough along in implementing its technology for anyone to determine which one is likely to win the battle for our desktops.

PETER HOEY

FrontPage Displays Many Features, Flaws

BY GEOFF DUNCAN

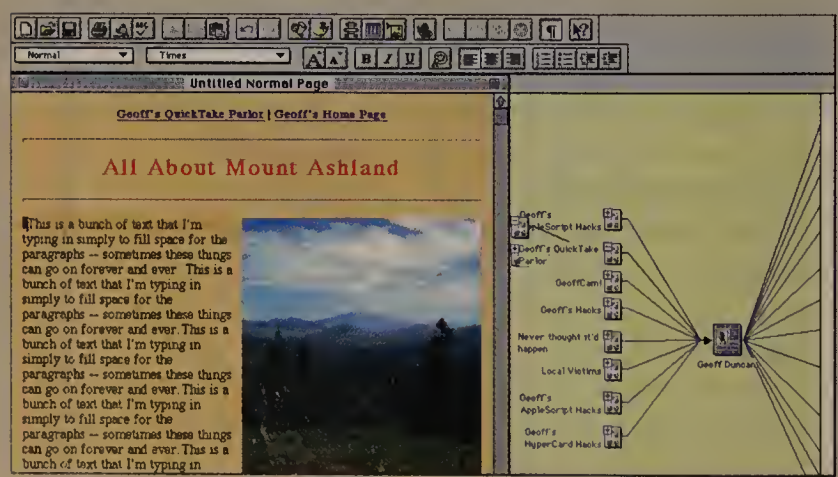
A look at an early prerelease version of Microsoft FrontPage for the Macintosh revealed a powerful HTML feature set saddled with an awkward interface. FrontPage's two primary applications are FrontPage Explorer for managing Web sites, and FrontPage Editor for authoring HTML documents. FrontPage Explorer provides listings of hyperlinks and files, plus a graphical view of a site's link structure. You can also view and reorganize a site, recalculate hyperlinks, verify URLs, import and export entire sites, and assemble a to-do list of common tasks (such as spelling checks, link verification, and global search-and-replace operations). Not only does FrontPage Editor provide a modern WYSIWYG editing environment for HTML pages that supports most HTML 3.2 tags and other extensions, but it also lets you create a variety of image maps. FrontPage Editor makes it easy to create and manage complex tables and frames, and sports a workable, if not elegant, HTML source editor. (Although FrontPage is supposed to support Netscape plug-ins, Java applets, ActiveX controls, and other technologies, these features are not yet implemented.)

Office Politics One potential advantage FrontPage has over competitors like Adobe PageMill and Claris Home Page is in its use of client-server technologies. FrontPage is designed to integrate directly with FrontPage-savvy Web servers (currently on Windows NT and Unix only), and ships with several working "WebBot Components" (CGIs) that can access remote databases, manage page counters, and much more.

But since these technologies work only with FrontPage-ready servers, their utility to Macintosh Web authors is questionable, even if Microsoft integrates Mac server technologies recently purchased from ResNova. Also, FrontPage's underlying technology and user interface is based on Microsoft's Office applications—great if you like Office or Windows 95, but the interface may seem deliberately obfuscating to Macintosh users, and FrontPage suffers from the same bottlenecks as Office applications.

Although it promises pervasive drag-and-drop support, FrontPage's use of Microsoft's OLE means you can't drag data into the program from the Finder or even from Microsoft Internet Explorer. Performing a sitewide search-and-replace assembles a list of hits, but you must do actual replacements on a file-by-file basis; similarly, replacing incorrect external URLs is a file-by-file operation. Other flaws include the lack of a macro function and scriptability. FrontPage requires a Power Mac with at least 16MB of RAM (24MB is recommended).

If Microsoft is able to clean up FrontPage and improve its performance, it might be useful for people who *must* work within a Windows or FrontPage environment. Otherwise, Macintosh Web authors should look elsewhere for site-oriented Web tools.



While you're editing a document in FrontPage, you can also see how the page links to other documents and sites.

new version of the Extensions Manager. While the primary focus was on improving system stability, Amelio says, initial testing within Apple indicates that System 7.6 also delivers a significant performance boost. (Apple was unable to provide a copy of System 7.6 to Macworld Lab to verify performance claims.)

Amelio says Tempo will go a step further—improving performance but also integrating the Internet and multithreading within the Finder. And Tempo will integrate the Mac OS 8 Finder, which was originally to be part of System 7.6.

As a demonstration of multithreading, which lets several tasks operate simultaneously and independently, an Apple employee copied a large number of files in the background concurrently with the opening and editing of a ClarisWorks word-processing document. This type of multithreading, called cooperative multithreading, should not be confused with the preemptive multithreading that requires a new OS core microkernel.

Tempo will also integrate the Internet into the Mac OS, so that the Net appears as a volume on the desktop. Apple is doing this by including Maxum's (630/830-1113, *http://www.maxum.com*) personal Web server software in the Mac OS; it's likely that this will be available for download before Tempo ships, from Maxum if not from Apple.

While Amelio said this object-oriented integration of the Internet and the OS would take place before the expected fall arrival of Nashville, Microsoft's next version of Windows 95, Nashville will provide a much tighter integration of the OS and browser in which the browser nearly becomes the operating system. Apple's more modest approach makes the Internet appear as a standard resource.

online

Faxing over the Internet

NEW PRODUCTS ALLOW USE OF THE INTERNET AS A FAX NETWORK

by Stephen Beale

The Internet, which has changed so many aspects of business communication, is poised to revolutionize one more: facsimile transmission. Just as you can use the Internet for cheap long-distance phone calls, you can also use it as an inexpensive conduit for conventional faxes or for printed documents sent in lieu of a fax.

Many of these products are presently geared toward PC users, but thanks to the cross-platform nature of the Internet, Macintosh users can take advantage of such capabilities as well.

Two approaches to Internet faxing have emerged. One uses the Internet simply as a carrier of conventional fax transmissions, replacing the phone network in much the same manner as products that enable long-distance calls on the Internet. The other approach—more promise than reality at this point—is to use the Web as a remote printing network, sending transmissions to printers or print servers that have embedded URLs.

Both approaches are less costly than conventional faxing, and the latter offers the additional benefit of higher-quality printed output.

Internet as Fax Network The ability to send a fax through the Internet is nothing new. For several years a variety of companies have offered Internet-based services

continues

ANOTHER MINDSPRING USER

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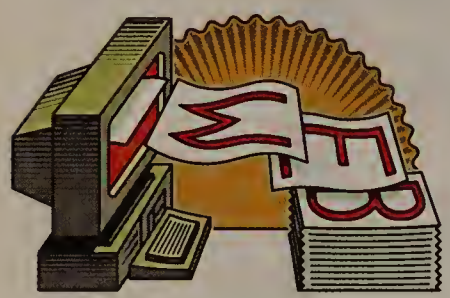
in which you send e-mail to a designated address to have it converted into a fax.

Newer technologies are integrating conventional fax technologies with the Internet more tightly. For example, NetXchange (415/346-4131, *http://www.ntxc.com*) offers a client-server system called Internet Xchange for Fax in which you send a fax to an Xchange server, designating its ultimate destination. The server then uses a least-cost routing function to send the transmission as cheaply as possible. The company offers cross-platform Java-based client software that can be used to send electronic faxes. You can also



use conventional fax machines equipped with an autodialer. The product isn't cheap, beginning at $2400 for a two-port system, but large organizations may find it cost-effective due to money saved on long-distance phone charges.

At the Comdex show in November, Panasonic (201/348-7000, *http://www.panasonic.com*) offered a technology demonstration of an Internet fax machine. Documents scanned by the prototype are converted into TIFF files and sent over the Internet to a designated e-mail address as an enclosure. Files can then be read with any application capable of viewing TIFF files. The TIFF files are in PC format, and the product at present is not configured for the Macintosh. However, adapting the Internet fax machine for Macintosh users does not appear to be a major hurdle.

Internet as Printing Network Further away are technologies that let you use the Internet as a gigantic printing network, completely bypassing the need for fax technology. Several companies, including Adobe Systems (408/536-6000, *http://www.adobe.com*), Tektronix (503/685-3150, *http://www.tek.com*), and Hewlett-Packard (800/752-0900, *http://www.hp.com*), have announced products that let you make printers directly accessible over the Internet. In essence, the printer has its own Web page through which you print the document. Adobe has promised this capability in PostScript Level 3.

Of perhaps greater significance is a recent announcement by Novell (801/222-6000, *http://www.novell.com*) of a new standard for printing over the Internet. The protocol specification, Lightweight Document Printing Application, was submitted to the Internet Engineering Task Force in November 1996 for consideration. The idea is to provide standards that make it easier to select and control remote printers over the Internet or corporate intranets. Novell has signed up a who's who of printing vendors to support the standard, including Adobe, Canon, Hewlett-Packard, IBM, Intel, Lexmark, QMS, Ricoh, Sharp, Tektronix, Toshiba, and Xerox. Novell has also enlisted the Multi-Function Peripheral Association to propose extensions to the specification to support faxing, scanning, copying, and other operations common to multifunction peripherals.

"There's a lot of uncertainty about whether you'd want to put your printer on the Internet," says Charles LeCompte, publisher of the *Hard Copy Observer* newsletter, which covers the printer industry. "There are a lot of issues around that, such as toner usage and security issues. But I think it makes a lot of sense."

PETER HOEY

Systems WATCH

BY MACWORLD STAFF

The Baiting Game Although Power Computing's PowerBase line of Macintosh systems has received favorable reviews, the company (512/388-6868, *http://www.powercc.com*) is getting increasingly bad press from the people who actually buy computers.

Nowhere is this more apparent than on PowerWatch (*http://lostworld.pair.com/powerwatch*), a Web site where users post their experiences with Power Computing products. And while some people do praise the systems, they're drowned out by a cacophony of complaints, ranging from stories of waiting weeks or months for a system's arrival, to being shipped a system that died within a week or two due to a malfunctioning hard drive or motherboard.

Customers are not alone: Macworld Lab has received several defective systems for testing that had to be replaced. Even more disturbing are reports that the company requires those who return defective systems to sign an agreement barring them from mentioning the problem.

Newer Goes Multiprocessor DayStar Digital (770/967-2077, *http://www.daystar.com*) has signed up Newer Technology (316/943-0222, *http://www.newertech.com*) as the latest licensee for its nPower multiprocessing technology. Newer plans to ship dual 180MHz and 200MHz upgrades around the time you read this. The multiprocessing technology will also be incorporated into other Newer products.

Speedier Doubler Connectix (415/571-5100, *http://www.connectix.com*) has upgraded Speed Doubler, its software accelerator for the Macintosh. With a street price of $60, Speed Doubler 2.0 boosts access to removable and hard drives and improves 680X0 emulation for Power Macs running nonnative applications. New features include a control panel for easier configuration; an improved Secure Erase function, making it virtually impossible to recover deleted files; and the ability to copy files from three different locations simultaneously. A synchronization feature helps users keep information on their PowerBooks synchronized with their desktop system. Current users can upgrade for $25.

Umax Hits Top Speed Last August, it was a technology demo, but in February, Umax Computer (510/226-6886, *http://www.supermac.com*) plans to make real a 240MHz version of its SuperMac S900 tower system. The S900/240 will cost $5795 and include 32MB of RAM, a 512K cache, a video card with 78MB of VRAM, a 2.1GB hard drive, 100BaseT Ethernet, six PCI slots, four open drive bays, and an 8× CD-ROM drive.

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MAC2TV

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Circle 256 on reader service card

best of show

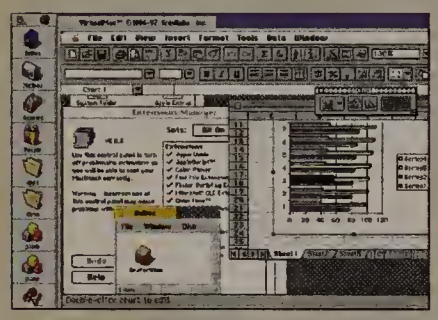
BEST PRODUCTS

Macworld Expo San Francisco 1997

ONCE AGAIN, *MACWORLD*'S EDITORS have made their picks for the Best of Show Awards, recognizing the hottest new products to be introduced at Macworld Expo. We examined dozens of new products and hand-tested the top contenders to make our final decisions. We rated them on innovation, usefulness, and that hard-to-define quality known as The Wow Factor. To be considered, a product had to be announced for the first time at, or shortly before, Macworld Expo.

VIRTUALMAC

Sure, the Apple-Be deal never happened, but the Be OS will still be available for many Mac systems. Users of these systems will find themselves thanking a company called Fredlabs (415/788-8512, *http://www.fredlabs.com*) for its VirtualMac software, which lets you run Macintosh applications from within the Be OS. You can even copy data from one OS to the other.



VirtualMac

POWERTOWER PRO 250MP

From Power Computing (512/388-6868, *http://www.powercc.com*) comes yet another Mac system that sets a new level of performance. The PowerTower Pro 250MP is the company's first dual-processor Mac, and with a pair of 250MHz PowerPC 604e processors, it is the Mac market's fastest multiprocessor system. The $5995 system also includes an upgradable 1MB cache, 32MB of RAM, and a 2GB hard drive. For $4995, you get the PowerTower Pro 225MP, with dual PowerPC 225MHz CPUs.

CODEWARRIOR 11

This latest version of the software-development tool from Metrowerks (512/873-4700, *http://www.metrowerks.com*) provides a single environment from which Macintosh programmers can create applications for the Mac OS, Windows 95, Windows NT, Magic Cap, and PowerTV. Whether you write in C, C++, Object Pascal, or Java, for Windows or for the Macintosh, you can now call CodeWarrior your home.

EYE CANDY

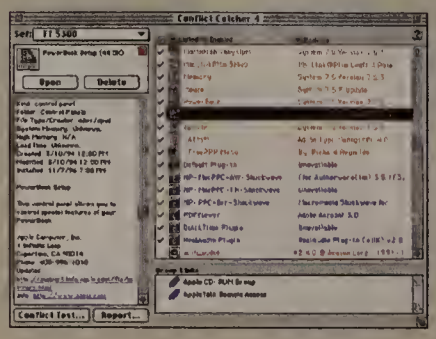
New Adobe Photoshop plug-ins abounded at Expo, but this set of filters from Alien Skin Software (919/832-4124, *http://www.alienskin.com*) stood out for its cool effects and elegant interface. Essentially an upgrade to Black Box, it includes revisions of Drop Shadow, Inner Bevel, and other old favorites, along with several new filters, including Fire, which makes it look as if your selection is burning, and Fur, which makes your image look like an animal's coat.

VECTORTOOLS

These vector plug-ins from Extensis (503/274-2020, *http://www.extensis.com*) replace DrawTools. Available in versions for Adobe Illustrator and Macromedia FreeHand, it adds several useful functions missing from both. You get a magic wand—click on one object, and it selects all other objects with similar characteristics. A Navigator tool makes it easy to get around your document when working in a magnified view.

CONFLICT CATCHER 4

This upgrade to the popular system utility from Casady & Greene (408/484-9228, *http://www.casadyg.com*) now manages plug-ins along with extensions and other Mac software components. Plus, it can set up your Mac to download software updates to popular programs via the Web. Version 4, which sells for $99.95, also provides hyperlinks to the Web sites of extension vendors, letting you get the latest information on system resources that may be causing problems.



Conflict Catcher 4

"WHAT'S NEXT FOR THE MAC OS?" *continued from page 33*

Programs running in the Blue Box will be able to share some data with programs running in the Yellow Box, and vice versa. Programs in the two environments can share data via Apple events (Apple's OS-based messaging technology) and via copy and paste. However, direct interapplication communications probably won't be allowed, so the two environments can't cause each other to crash if something goes wrong in one of the boxes.

Not yet clear is how users and programs will deal with files created by programs running in the two environments. While the hope is to let Yellow Box and Blue Box programs access each other's drives and folders, it is too early for Apple to know whether or how it can accomplish that goal, at least in the 1998 releases.

Technology Issues

Among the technologies issues Apple needs to address are the following.

Symmetric Multiprocessing Unlike the Be OS, which Apple also considered buying, the Next OS in its current form supports this capability only in theory. (Symmetric multiprocessing lets multiple CPUs run concurrently and automatically spreads computation work among all available CPUs. The multiprocessing capability in today's Macs requires that programs be specially written for multiprocessing.)

Today, the Next OS does not run with symmetric multiprocessing applications on any platform, but Avie Tevanian, the former Next executive who now heads the Mac OS/Next OS project, says this feature will be added.

Display PostScript One benefit of the Next OS is its use of Display PostScript, which Next licensed from Adobe Systems. As a result, applications no longer need a separate PostScript interpreter for their output, and users get greater fidelity between what they print and what they see on screen. Unknown is what this means for the future of ColorSync and QuickDraw GX; Hancock says such features may need to be added to Display PostScript.

Object Architectures Metrowerks, developer of the leading C++ tool CodeWarrior, has quickly stepped up to bat, saying it will offer CodeWarrior compilers and runtime enablers based on Objective C, the highly object-oriented programming language for the Next OS.

The New OS Team

Apple's break with the past goes beyond the OS strategy alone. To implement its plan, Apple is betting on the talents of Tevanian, formerly Next's vice president of engineering.

Reporting to Hancock, Tevanian will lead a team composed of the few remaining Copland engineers as well as some 100 Next engineers. Hancock has made it clear that Apple will continue working on versions of the Next OS and Next's WebObjects server-development tool for other platforms. But Tevanian's most immediate job is to ship a new Macintosh Operating System.

Online Updates

FOR ONGOING COVERAGE OF THE NEXT OS/MAC OS STRATEGY AS IT DEVELOPS, TURN TO MACWORLD DAILY AT *HTTP://WWW.MACWORLD.COM/DAILY/*.

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Circle 26 on reader service card

New Products

THE LATEST MACINTOSH RELEASES

COMMUNICATIONS

Intelligent E-mail

Claris (408/727-8227, *http://www.claris.com*) Emailer 2.0 seems to do everything but type the message for you. New features in the $49 program include support for an unlimited number of e-mail accounts, multiple signatures, and the ability to specify an upper limit on the size of e-mail downloaded.

Mail Stash

Originally designed to store e-mail in Claris FileMaker Pro databases, MailArchiver from Blue World Communications (206/313-1051, *http://www.blueworld.com*) is becoming a popular all-around e-mail storage solution; it works with Claris Emailer, Qualcomm's Eudora, and the Apple Internet Mail Server, among others. Once messages are stored in the database, you search them using standard FileMaker commands. Prices are $79 for an electronically distributed version and $119 for a shrink-wrapped version.

DISPLAY

CRTs Hold Their Own

The computer industry may be moving toward LCD displays, but CRTs remain the most cost-effective monitors for most applications:

• Panasonic (201/348-9090, *http://www.panasonic.com*) has introduced the Panaflat PF70, a flat 16-inch CRT monitor that sells for less than $1000. Maximum resolution for Macintosh users is 1152 by 870 pixels.

• Mitsubishi (714/220-2500, *http://www.mitsubishi-display.com*) has released several new CRT models. The $1699, 21-inch Diamond Pro 91TXM offers an enhanced aperture grille of 0.28mm, a maximum resolution of 1600 by 1200 pixels (at a 76Hz refresh rate), and 180MHz video bandwidth. The 17-inch Diamondtron 87TXM, priced at $849, features a 0.25mm aperture grille mask, 1600-by-1200 resolution (66Hz refresh rate), and 135MHz video bandwidth. The 17-inch Diamond Pro 67TXV, with a $749 price tag, features a 0.25mm aperture grille mask, 1280-by-1024 resolution (64Hz refresh rate), and 100MHz video bandwidth.

FINANCIAL

Held Accountable

Credit drives the economy, and BestWare (201/586-2200, *http://www.bestware.com*) has just released version 7 of M.Y.O.B. Accounting, which lets business owners set credit terms on a per-customer basis. The update features an improved help system and comprehensive customization options. M.Y.O.B.'s Cue Cards guide users through more than 100 advanced tasks. Estimated street prices for M.Y.O.B. Accounting version 7 are $80 without a payroll option and $140 including payroll.

GRAPHICS

Picture It

Jasin Design One, a $160 collection of digital images from Jasin Design (303/837-1888), features 150 images in Macromedia FreeHand 5.5 and FreeHand EPS, Adobe Illustrator 5.5, and 72-dpi PICT formats. The categories are People, Sports, Animals, Heavenly Bodies, Mythology, Radicals, and Miscellaneous.

Get Organized

Designers aspiring to develop their organizational abilities can turn to Fetch 1.5 ($99.95), an upgrade to the multimedia database program from Extensis (503/274-2020, *http://www.extensis.com*). The new version offers faster performance, particularly in tasks such as cataloging and previewing images.

NETWORKING

Mac Does ATM

It's a new era in Macintosh networking since Apple (408/996-1010, *http://www.apple.com*) released its ATM Network Software to network card developers. Now, asynchronous

Jasin Design One

transfer mode (ATM), commonly used for network backbones, could be seeing new applications for smaller networks. Apple's ATM Network Software is a module that extends the functionality of Open Transport.

• Following on the heels of Apple's announcement, Adaptec (408/945-8600, *http://www.adaptec.com*) has announced Macintosh drivers for its PCI ATM cards, running at 25 Mbps and 155 Mbps. The 25-Mbps model costs $199, or $349 with more active virtual circuits. The 155-Mbps model is $495 with unshielded twisted-pair interfaces and $595 for the multimode fiber interface. Customers who have already purchased these cards can download the driver at no charge from Adaptec's Web site.

• Integrated Micro Solutions (408/369-8282, *http://www.integratedmicro.com*) has also announced 25-Mbps and 155-Mbps ATM adapters supporting Apple's Network Software. The 155-Mbps model sells for $599, and the 25-Mbps adapter is $359.

My Address Is Your Address

Looking for a way to lower ISDN connection costs? Farallon Communications' (510/814-5100, *http://www.farallon.com*) new Netopia ISDN SO-Smart Routers enable all machines on the router's LAN to share one Internet IP address. As a result, an entire office can connect with one dynamic IP account, saving money in the process. Model 635, which routes IP and IPX, was planned to be available by press time, and will sell for about $849; Model 435, which routes IP, IPX, and AppleTalk, should be about $1099.

ONLINE

WebPainter Goes Live

Totally Hip Software (604/685-6525, *http://www.totallyhip.com*) has released the beta of WebPainter for OpenDoc, a new component version of the company's paint program for creating animation and GIF graphics for Web pages and corporate intranets. Users can drag and drop the WebPainter component into a word processing document to create a page containing live animations. You can download the beta of WebPainter for OpenDoc from c|net's Download.com site, at *http://www.DOWNLOAD.COM/Mac/Result/TitleDetail/0,4,0-18682,00.html*.

WebPainter

Plug for WebSiphon Leaks

Purity Software (512/328-2288, *http://www.purity.com*) has released an update to its $495 Web authoring tool, WebSiphon. WebSiphon 1.0.2 fixes various bugs,

continues

including a memory leak related to the Preprocessor action and one in the vCountMatching() function that caused occasional crashes. Also corrected are problems with memory management and printing large lists. The update can be downloaded from Purity's Web site.

A Cache Bonus

StarNine (510/649-4949, *http://www.starnine.com*) is shipping a substantially faster upgrade to its WebStar Web-server software. Because WebStar 2.0 caches as much of a hosted Web site as possible, the company claims it can now serve up Web sites at least twice as fast as the old version. For the same price as the previous version ($499), WebStar 2.0 ships with a built-in Java Virtual Machine and supports Netscape's Secure Socket Layer (SSL).

PRINTING

Low-Cost Network Printer

For those who don't need PostScript or LocalTalk, Hewlett-Packard (800/752-0900, *http://www.hp.com*) is shipping its $3869 midrange LaserJet 5Si NX printer, an Ethernet-only addition to its LaserJet 5Si family of network printers. The 600-by-600-

HP LaserJet 5Si NX

dpi LaserJet 5Si NX prints up to 24 pages per minute. It offers two 500-sheet trays and a 100-sheet multipurpose tray. Optional accessories include a $1299, 2000-sheet input tray; a $669 duplex unit that supports up to 11-by 17-inch paper and a 100-piece envelope feeder; an $1889 multibin mailbox; and a $549, 100-envelope feeder.

Apple's Latest Laser

A new $2195 printer bundle from Apple Computer (408/996-1010, *http://www.apple.com*) combines the LaserWriter 12/640 PS Plus with 12MB of RAM, a 500-sheet paper cassette and feeder, and a duplex printing unit. Options include a $149 envelope cassette, a $49 face-up output tray, and a $120 toner cartridge. The 600-dpi printer features PostScript Level 2 and PCL emulation, along with autosensing and autoswitching Ethernet, LocalTalk, and parallel ports.

PRODUCTIVITY

Live from Nisus

Nisus Software (619/481-1477, *http://www.nisus-soft.com*) is shipping Nisus Writer 5.0, a $69.95 upgrade to the PowerPC version of its word processor that adds support for Apple's OpenDoc technology. The software acts as a Live Objects container, so users can drag and drop Live Objects parts, such as table editors or graphing programs, into their documents. The new version also offers enhanced Internet capabilities.

Getting Hyper

Apple Computer (408/996-1010, *http://www.apple.com*) has released HyperCard 2.3.5, an update to its media authoring software that will provide a bridge to version 3.0. The $99 update consists of performance enhancements, but Apple is also bundling it with other software packages with an eye toward making it a tool for creating Web content. You'll also need HyperCard 2.3.5 if you want to create stacks compatible with version 3.0.

PUBLISHING

The House That Corel Built

Corel (613/728-8200, *http://www.corel.com*) has announced a Macintosh version of Print House, an entry-level draw program aimed at users who want to create greeting cards, business forms, signs, and other simple graphics. The software features rectangle, ellipse, pen, text, and polygon tools, and also allows you to flip, rotate, resize, and group graphic objects. The $40 package ships with 1000 sample files, 1000 photos, 100 fonts, 5000 clip art images, and templates from Paper Direct.

Another Camera from Kodak

Kodak (716/726-7260, *http://www.kodak.com*) is shipping the DC25, its latest digital camera. The $499 camera features a built-in flash, an LCD display for picture review, and an optical viewfinder. The advantage of the viewfinder, Kodak says, is that you don't deplete the batteries as rapidly as you would if you previewed images through the LCD.

Kodak DC25

SCIENCE/ENGINEERING

MathCAD for Internet

MathSoft (617/577-1017, *http://www.mathsoft.com*) is now shipping MathCAD Plus 6 for the Mac ($350), which adds the capability to link and hyperlink documents over intranets, the Internet, or local Web servers. Other new features include improved editing and formatting, simplified menu structures, and the ability to create and embed animation within a worksheet.

STORAGE

FWB Switches Focus

FWB (415/463-3500, *http://www.fwb.com*) has released three utilities for managing and optimizing hard drives and RAID systems.

- Targeting a common source of bottlenecks—disk I/O operations—Turbo ToolKit 1.0 is a suite of three extensions that speed performance. TurboDisk continuously defragments your disk in the background to optimize disk performance. The other extensions cache data to RAM: TurboRead buffers frequently used data blocks for faster access, and TurboBoot caches extensions to speed system start-up.
- RAID ToolKit has been upgraded to support "warm-swapping" removable canisters, drag-and-drop array management, and more than 800 devices. In addition to disk mirroring (RAID 1) for fault tolerance, version 2.0 offers data striping (RAID 0), which increases throughput by letting you treat partitions on two separate drives as one logical volume.
- Hard Disk ToolKit•PE has also been upgraded to 2.0. New features of the disk-management utility include a simpler interface, one-button disk configuration, drag-and-drop support, and online help.

List prices are $79 each for Hard Disk ToolKit•PE and Turbo ToolKit and $299 for RAID ToolKit 2.0; site licenses are also available.

Storage on the Go

Sony Electronics (408/432-1600, *http://www.sony.com*) has introduced a 6× portable CD-ROM drive. The $400 PRD-650 Discman weighs 10 ounces and uses 4 AA batteries or an AC adapter. As an option, you can power the drive with a lithium-ion battery, which has a longer usage cycle than a NiCd battery. The PRD-650 connects to a PowerBook through a SCSI-2 cable.

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Reviews

E-Mail Programs

FIRSTCLASS, QUARTERDECK MAIL, AND QUICKMAIL GO BEYOND BASIC E-MAIL

JENNIFER JESSEE

NOT TOO LONG AGO, WE WERE happy to be able to send a text message from one desktop to another through the magic of e-mail. Today, users want to send styled text, pictures, sound, and movies with a click of the mouse, and they expect Internet access as well. Three new products aimed at the Mac departmental mail market are CE Software's QuickMail Pro 1.0, StarNine's Quarterdeck Mail 4.0 (formerly Microsoft Mail for AppleTalk Networks), and SoftArc's FirstClass 3.5. QuickMail Pro is a client-only package that requires a separate server; Quarterdeck Mail and FirstClass are complete client/server systems. Although none of the three delivers the multimedia and Internet features necessary to be considered a breakthrough product, each goes beyond basic message handling.

Getting Started

All three programs have a core client application for composing, sending, receiving, reading, searching, sorting, and filing messages, and all three require a server to act as a post office for mail en route from one user to another. Quarterdeck Mail and FirstClass ship with proprietary servers that run over AppleTalk; QuickMail Pro uses the Internet-standard Post Office Protocol (POP) version 3, which lets it converse with POP mail servers (such as Apple's Internet Mail).

Offering a choice of servers makes QuickMail Pro more flexible than the others, but products that bundle all the necessary software in a single package have an undeniable advantage. CE Software is aware of that and has licensed Software.Com's Post.Office POP mail server, scheduled for release in early 1997.

Setting up each program's server component is a straightforward process, whether you're using a third-party server (with QuickMail Pro) or a bundled server (with Quarterdeck Mail or FirstClass): you simply install the server software, register user names and passwords, and set a few preferences. All three products have excellent documentation explaining server concepts and setup procedures (although QuickMail Pro's documentation is necessarily limited).

With the server up and running, you're ready to distribute the client application and documentation to users. Because all three vendors sell their product by the "seat," or user, license control is an important issue—particularly if you're setting up many users. A license key gives a specific number of users access

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to the server, allowing the programs to be distributed over a network. All three products have thorough end-user documentation, but only FirstClass supplies a handy quick-reference card for each user—a boon to help-desk administrators.

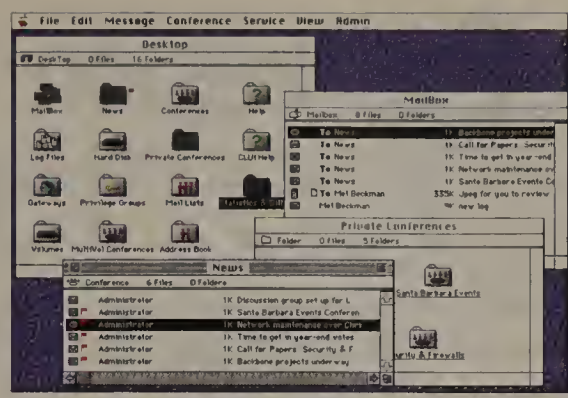
Inside the Envelope

Beyond basic message handling, e-mail administrators want mail stream encryption, automated backups, interserver message routing, batch account administration, and Internet interoperability. Users want styled text, forms processing, automatic replies, drag-and-drop attachment handling, a spelling checker, public-key encryption, and rule-driven filtering.

On the server side, both Quarterdeck Mail and FirstClass have competent backup mechanisms, routing between message servers, and batch account administration. Quarterdeck Mail also sports a handy POP server to let clients (such as Qualcomm's Eudora and Claris Emailer) access mail in its proprietary post office format. FirstClass lets you encrypt all mail traffic between servers, providing protection from network snoopers.

Although Internet connectivity software isn't bundled with either Quarterdeck Mail or FirstClass, it's available through separate SMTP (Simple Mail Transfer Protocol) gateway products. (QuickMail Pro, because it uses Internet-standard mail protocols, is Internet-ready right out of the box.) Quarterdeck Mail also has gateways for Microsoft Exchange and UUCP (Unix-to-Unix Copy Program, an Internet mail-transport mechanism); FirstClass offers gateway options for Microsoft Mail and Lotus cc:Mail.

Because the client application is the face an e-mail system presents to users, the client's features are critical. First prize in this area belongs to FirstClass, which goes beyond traditional tabular e-mail lists to provide a customizable, icon-based desktop interface (see "First-Class Delivery"). You can design a common environment that includes not only the usual folders for incoming and outgoing mail, but folders for bulletin boards, conference areas, and chat rooms as well. No other e-mail server offers the ability to create such a community ambience. FirstClass also incorporates such novel capabilities as user-customizable forms, background file transfers, built-in graphic viewers, and access to the entire file system through the FirstClass desktop.



First-Class Delivery FirstClass's rich suite of e-mail services is delivered in a classy graphical interface. Besides providing basic mail handling, the program offers users access to conferences and bulletin boards—a handy feature for collaborative efforts.

If you have a microphone hooked up to your Mac, you can send voice messages via Quarterdeck Mail. That package also supports a rule-driven filtering system that scans your messages as they arrive, automatically filing them in the appropriate folder (or the Trash Can); it can even highlight URLs and automatically pass them to your Web browser. Another nifty feature in Quarterdeck Mail is the ability to store a selected group of messages as an HTML document, complete with a hypertext table of contents—an easy way to publish mail discussions on the Internet.

QuickMail Pro also supports user-customizable forms, rule-driven filters, and voice messages, but for some reason omits such Web-oriented features as URL links and HTML output. However, its interface—the cleanest of the bunch—makes the program easy to use, which may be more important in many office environments than a rich feature set.

Postage Due

Surprisingly, none of the products supports public-key encryption or offers hooks to third-party encryption tools. Public-key encryption, such as that offered by the shareware PGP (Pretty Good Privacy), is the only way users can communicate over e-mail with any assurance of privacy. When you consider that e-mail products for the PC have had that capability for years, this is a significant deficiency.

Another shortcoming is that none of the products offers access to MIME message content. (MIME is the standard for exchanging multimedia objects, such as styled text, HTML, imagery, voice, and video, across platforms over the Internet.) Though all three can send and receive MIME attachments, the contents aren't accessible from within the client application; instead, you have to launch the appropriate helper application.

The Last Word

The new crop of Macintosh e-mail systems offers a mixed bag of features. If you want to set up a complete e-mail community for your organization, FirstClass is the way to go; its icon-based user interface makes organizing shared discussions easy. For instant Internet interoperability and a good basic feature set, QuickMail Pro is a fine choice (though you'll have to buy the server separately until CE Software ships Post.Office). For those who don't need the sophistication of FirstClass but still want an all-in-one e-mail system, Quarterdeck Mail is a cost-effective alternative to QuickMail's à la carte packaging.—MEL BECKMAN

FirstClass 3.5

RATING: ★★★★/7.6 **PROS:** Offers encryption, multiple-gateway support, and conference and chat capabilities. **CONS:** No public-key encryption; no audio or MIME-content processing; lacks message filtering and automatic filing. **COMPANY:** SoftArc (905/415-7000, *http://www.softarc.com*). **LIST PRICE:** $495 with 5-user licenses; additional licenses $35 to $79 depending on quantity.

Quarterdeck Mail 4.0

RATING: ★★★/6.0 **PROS:** Integrated POP server; mail-to-HTML converter; rule-driven message filtering; supports voice messages. **CONS:** Limited gateway support; lacks MIME-content processing; no public-key encryption; no customizable forms. **COMPANY:** StarNine Technologies (510/649-4949, *http://www.starnine.com*). **LIST PRICE:** server $395; 5-user pack $245.

QuickMail Pro 1.0

RATING: ★★★/6.6 **PROS:** Nonproprietary server architecture; rule-driven message filtering; voice messages. **CONS:** Lacks gateway to non-Internet mail servers; no public-key encryption; no MIME-content processing. **COMPANY:** CE Software (515/221-1801, *http://www.cesoft.com*). **LIST PRICE:** $69.95 (for 1 user) to $3449.95 (for 100 users).

Fractal Design Expression

OBJECT-ORIENTED NATURAL-MEDIA DRAWING—AT LAST

EVEN IF YOU DON'T KNOW MUCH about computer graphics, you probably know that pixel-based bitmapped paintings are soft and organic-looking, while object-oriented vector drawings are sharp and precise. Fractal Design's pixel-based Painter, for example, lets you create artwork that looks as if it were drawn with real pencils, pastels, and paintbrushes, while Adobe's vector-based Illustrator produces pristine designs that mimic a fastidious draftsperson armed with a rack of technical pens. Occasionally, brave graphics applications attempt to cross the line—Live Picture defines brushstrokes as independent objects, FutureWave's SmartSketch takes a painterly approach to vector-based drawing—but until recently, there was little true integration of the two genres.

Expression 1.0 changes all that. Using vectors—and only vectors—Expression lets you render continuous-tone artwork that's virtually indistinguishable from a bitmapped painting, as deftly as if natural media and Bézier paths had been promised to each other at birth. Expression is one of the strongest software debuts in recent memory, ranking among must-have Mac graphics programs.

The Missing Link

Superficially, Expression is the opposite of SmartSketch. Where SmartSketch lets you manipulate vector objects as if they were pixels, Expression lets you create paintings using objects. Very simply, you draw paths, apply traditional-looking brushstrokes to them, and export the final graphic as a bitmap or a vector file. The resulting image looks like something created with Painter, except that you can edit the brushstrokes on a point-by-point basis. You can also transform, clone, and swap brushstrokes without altering the composition of your artwork. Imagine being able to reshape every brushstroke in Painter, and you have a fair idea of what Expression feels like.

But where SmartSketch is a modest, inexpensive sketching utility, Expression is a professional-level illustration environment that aspires to be the equal of Illustrator and Macromedia FreeHand. It doesn't always succeed, but it comes closer than any first-version application yet.

Skillful Drawing Tools

If you're familiar with other graphics programs, you'll quickly settle in to Expression. The program uses industry-standard keyboard modifiers for zooming and scrolling, and offers a navigation palette for repositioning the page view and rotating the canvas. The palette lacks an image preview, but it's unobtrusive and functional. Expression also lets you interrupt screen redraws and switch to one of two wire-frame display modes.

No Objects Were Harmed Expression's variable-width brushstrokes let you modify line weights, opacities, and colors to create new images without drawing a single line. The underlying structure is pure vector art, despite the painterly appearance.

You can draw point-by-point Bézier paths using a pen tool comparable to Illustrator's or opt for less complicated polygons and B-spline curves. Most essential path-editing tools are present, and you can add, delete, and convert points with complete freedom—though it's harder to join paths than it ought to be. Expression also lets you align, distribute, and layer objects. Even with these amenities, you may prefer to create paths in another application; Expression imports Illustrator EPS and CorelDraw Exchange documents, but not Illustrator 6 files, so you can't import paths from Photoshop 4 (which shares this format).

Strokes of Genius

Although Expression offers admirable drawing and editing tools, it's much more than an Illustrator knockoff. Breaking from the PostScript drawing model, Expression lets you create variable-width lines that ebb and flow like real brushstrokes. These strokes can be combined to form single objects, whole drawings, and even multiviews, which animate the stroke between two extremes.

Expression can also vary the opacity of a stroke so that lines build on top of each other. You can create free-form lines with a pressure-sensitive tablet, and rather than tracing a closed outline around your stroke, as in FreeHand or Illustrator, Expression saves pressure information at various points along the path. Although you can't modify the pressure points, it's still a giant step beyond anything in other object-oriented graphics programs.

Expression is every bit as imaginative and meticulous about emulating real-world brushstrokes as Painter. By default, brushes stretch evenly along a path's length. Alternatively, you can anchor the ends of a brush and stretch just the middle, or avoid stretching altogether and repeat the brushstroke along the path. Expression allows you to slant a brushstroke with respect to its path, twist strokes like a corkscrew, and mask the strokes of one path with the strokes from another—a great way to achieve hand-painted fills.

The Last Word

Expression's diligent attention to brushstrokes may seem like something of a one-hit wonder, and not a particularly innovative one at that. But Expression takes its role as a natural-media drawing program seriously, and although its basic premise is simple, its implementation is highly imaginative and painstakingly thorough. Expression is that scarcest of applications: a program without peer.—DEKE McCLELLAND

RATING: ★★★★/8.6 **PROS:** Natural-looking artwork in an object-oriented environment; good drawing and editing tools; unprecedented variable-width stroking capabilities. **CONS:** Minor editing omissions; can't import Illustrator 6 format. **COMPANY:** Fractal Design (408/430-4228, *http://www.fractal.com*). **LIST PRICE:** $449.

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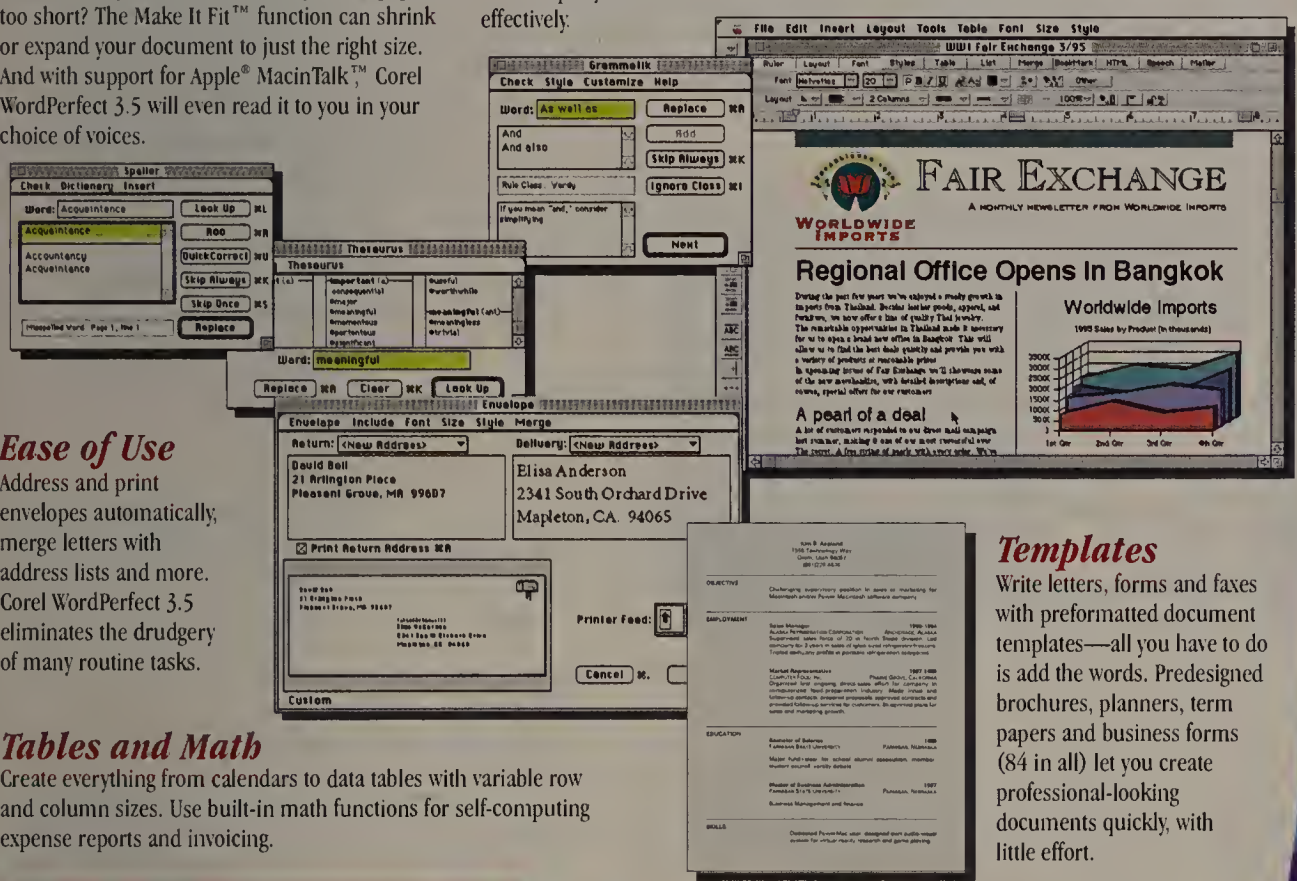

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Adobe Persuasion 4.0

PRESENTATION PROGRAM MAKES THE LEAP TO THE WEB

AFTER RECEIVING NO MAJOR revisions in more than two years and very little advertising exposure, Persuasion looked as if it might be abandoned by its new owner, Adobe Systems. The release of version 4.0 should put the rumors of Persuasion's impending demise to rest. While it doesn't have every feature I'd hoped for (see *Reviews*, September 1994), Persuasion 4.0 is a solid upgrade that should be particularly appealing to those who want to publish their presentations on the Web.

All in the Family

Persuasion's dialog boxes, menus, and tool palettes have been revamped to resemble those of two other Adobe programs, Photoshop and Illustrator. I especially like the new color palette, which is much more logical and includes a handy list view similar to Microsoft PowerPoint's. The text palette is also more compact, sporting a pop-up menu that lets you access the character- and paragraph-formatting dialog boxes.

The Layers menu—at the bottom of the slide window in Persuasion 3.0—is now a convenient palette; a pop-up menu lets you choose from 13 magnification levels, twice as many as in the previous version (see "Multiple Layers"). Another new command automatically arranges all the active tool palettes at the side of the window, although you still can't dock them at the top or bottom.

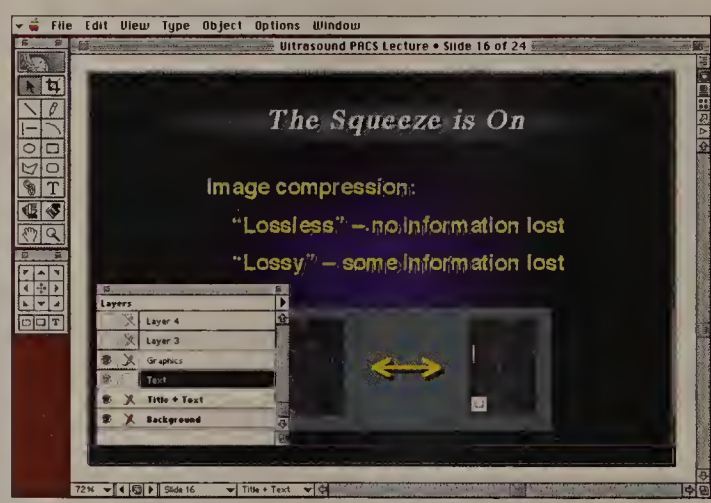
In keeping with its new place in Adobe's product family, Persuasion now lets you import or drag and drop native Photoshop and Illustrator files into presentations with layers intact. Version 4.0 also supports several new file formats, including EPS and JPEG for export and TIFF, JPEG, and GIF for import.

Other welcome additions include a tool for cropping images, an eyedropper tool similar to Photoshop's, and an enhanced nudge palette that allows finer control over the size and position of objects on a slide.

Caught in the Net

Persuasion's new link tool lets you attach Internet URLs to any object on a slide; clicking on the object while the presentation is running launches your Web browser and takes you to the specified page. Persuasion also lets you drag and drop URLs from your browser onto a slide.

You can export slides to the Web using Adobe's Portable Document Format (PDF), which lets you transfer whole presentations to your Web server with text, graphics, and hyperlinks intact. (Persuasion uses Acrobat Distiller to perform the translation; you can also create a PDF file by printing your presentation using an included Chooser extension.) Users can then view presentations in PDF format with Adobe's free Acrobat Reader.



Multiple Layers Persuasion's new Layers palette lets you rename, lock, and hide individual layers or assign objects to them.

Adobe's approach to Web publishing has advantages and disadvantages. The rich PDF format ensures that your presentation retains its antialiased text and finely detailed graphics on the Web. But until PDF gains universal acceptance, there's no guarantee that everyone browsing the Web will be able to view your presentation. HTML export would be a useful option, even at the expense of fidelity.

Still Missing in Action

Surprisingly, a few of Persuasion 3.0's shortcomings remain uncorrected in the new version. There's still no way to draw Bézier curves, and your animation options are limited to moving objects horizontally or vertically—you can't animate motion along a path, for instance. And Persuasion still doesn't directly support text rotation, although you can import rotated text from other applications.

Persuasion's spelling checker hasn't improved much, either. The most glaring annoyance is the need to click on an Ignore button or hit the return key after adding a word to the dictionary. I also have mixed feelings about Persuasion's companion charting and table applications, Adobe Chart and Adobe Table, both unchanged from version 3. Although Chart's wealth of graphing options makes the long launch time almost worthwhile, having to run a separate program to create simple tables is frustrating.

Two for the Price of One

Persuasion 4.0 runs on any Mac with a 68030 processor, although a 68040 machine or a Power Macintosh is recommended. You'll also need plenty of memory: Adobe suggests 16MB for Persuasion, an unrealistic proposition if you have less than 32MB of RAM installed.

Both the brief quick-start manual and the comprehensive user guide sport dual Macintosh and Windows logos. That's no accident—the box ships with Mac and Windows installers and licenses, a big plus if you work with both operating systems. The CD also includes an application that lets you translate PowerPoint 4.0 files into Persuasion format, although I'd prefer to import them directly. A limited version of Adobe Type Manager 4.0 is also included, along with a generous sampler of textures, fonts, clip art, and sounds.

The Last Word

Persuasion's revised interface and added features more than outweigh its deficiencies, and its new feature set is much richer than PowerPoint's. Although there are better alternatives for Web-page design—Adobe PageMill among them—Persuasion is an excellent tool for creating presentations for the boardroom, the classroom, and the Internet.—FRANKLIN N. TESSLER

RATING: ★★★★/7.1 **PROS:** Improved user interface; more import and export options; ships with Mac and Windows versions. **CONS:** Separate table and charting programs; poor spelling checker. **COMPANY:** Adobe Systems (408/536-6000, *http://www.adobe.com*). **COMPANY'S ESTIMATED PRICE:** $395.

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HTML Editors

PAGESPINNER AND WORLD WIDE WEB WEAVER TAKE A NON-WYSIWYG APPROACH TO WEB AUTHORING

ON THE CONTINUUM OF WEB-authoring programs, WYSIWYG tools like Adobe PageMill (see *Reviews*, February 1997) and others that try to shield the user from HTML are at one end; at the other are programs that take a text-only, code-head approach, like Bare Bones Software's BBEdit (see *Reviews*, June 1996). Somewhere in between lie non-WYSIWYG programs that let you tweak the HTML while still showing you the results of style tags. Two of these—Miracle Software's World Wide Web Weaver and Optima System's PageSpinner—prove not only that such HTML editors still make sense, but that they occasionally outshine their all-graphical counterparts.

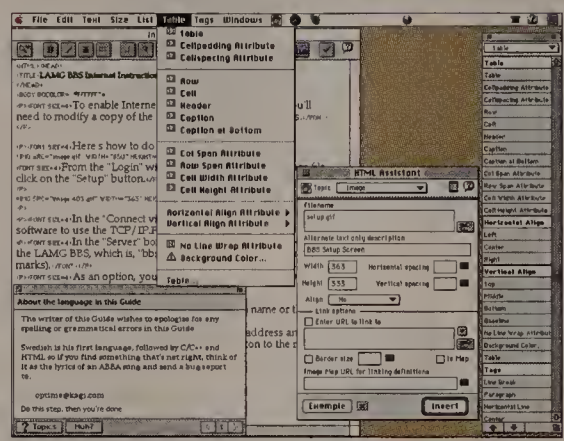
Help for HTML Newbies

With its excellent help features and the ability to insert any HTML tag, PageSpinner is a good starting point for new HTML authors and a useful tool for those who need to create a slew of Web pages. This shareware program can be downloaded from Optima System's Web site or from the Mentioned in Macworld area of Macworld Online's Software Library (*http://www.macworld.com/software*).

PageSpinner's main editing window displays the text of your Web page, with color-coded HTML tags and formatted body text. If you don't want to type in the tags, you can use PageSpinner's Tags menu or the HTML Assistant, a window that helps you add page elements by listing their required and optional attributes.

Small icons in PageSpinner's menus and dialog boxes tell you whether a particular tag or tag attribute is part of the current HTML 3.2 specification or a Netscape Navigator or Microsoft Internet Explorer extension. The Tags menu lets you easily insert any standard tag, plus some commands controlling search sites' automatic indexers and Maxum's NetCloak. Another nice touch is the ability to insert tags for Java applets and common JavaScript functions. And the program shines in its extensive use of built-in help, including a nicely implemented Apple Guide and balloon help.

But although PageSpinner does a good job of creating Web pages, it has serious problems when it comes to editing existing documents. Say you want to change a page's background color, an attribute specified in the **<BODY>** tag. The HTML Assistant lets you set the new color, but clicking on the Apply button creates an additional **<BODY>** tag rather than modifying the existing one. Because an HTML document can have only one **<BODY>** tag—and because the program



Spinner's Delights PageSpinner's hand-holding includes an Apple Guide; the HTML Assistant, which helps you add common page elements; and the floating menu palette listing all the program's commands.

doesn't check and validate HTML—if you're not careful, you can end up with seriously flawed pages. And PageSpinner is incompatible with the FaxMenu part of STF Technologies' Faxstf (though you can turn off FaxMenu and still use the rest of the fax software).

Stodgy but Solid

World Wide Web Weaver lacks PageSpinner's sophisticated interface and extensive help, but it still has plenty of power. It breaks up the document window into four sections—Page Head, Header, Body, and Footer—reflecting the parts of an HTML document. This convention lets you use a single command, Update Page Sections, to change common design elements on multiple pages.

You enter tags either by typing them in or by choosing them from the Tags menu or the tool palettes. One of Web Weaver's customizable palettes contains special characters, such as diacriticals and the copyright symbol; another lists tags for line breaks and paragraph centering. More complex tags have their own editing dialog boxes, each of which includes options for using the tag's attributes. While most of those editors work well, some are awkward to use because they don't give you enough space on the screen.

Unlike PageSpinner, though, Web Weaver has no problems validating tags for proper syntax or editing existing pages, and a Re-Edit Tag command makes it easy to modify tables, forms, frames, and so on. Web Weaver doesn't include the wide variety of tags that PageSpinner does, so you may find yourself looking up tags a bit more often.

Web Weaver comes with a printed manual and includes balloon help but no Apple Guide. And although both programs have scratchpads for storing boilerplate information, PageSpinner's 100 nameable pages make it the more useful of the two.

The Last Word

Building Web pages and maintaining them are two very different tasks, and each of these programs excels at one of them. With its outstanding built-in help and HTML Assistant, PageSpinner is a great choice for creating Web pages—particularly for novice authors. If your focus is on maintaining a Web site, or if you're an experienced Web developer, World Wide Web Weaver is the better choice; it's a little more expensive, but its knack for modifying existing Web pages justifies the extra cost.—TOM NEGRINO

PageSpinner 1.2.2

RATING: ★★★/6.9 **PROS:** Good HTML-creation tools and assistants; excellent built-in help; includes HTML 3.2 tags. **CONS:** Mediocre page maintenance; minor incompatibility with Faxstf. **COMPANY:** Optima System (*http://www.algonet.se/~optima/pagespinner.html*). **SHAREWARE FEE:** $25.

World Wide Web Weaver 2.0.2

RATING: ★★½/6.8 **PROS:** Good at editing existing pages; validates tags for correct syntax. **CONS:** Doesn't include all current tags; some tag editors feel a bit cramped. **COMPANY:** Miracle Software (315/265-0930, *http://www.miracleinc.com*). **LIST PRICE:** $89.

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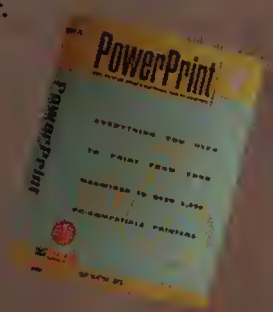

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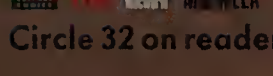

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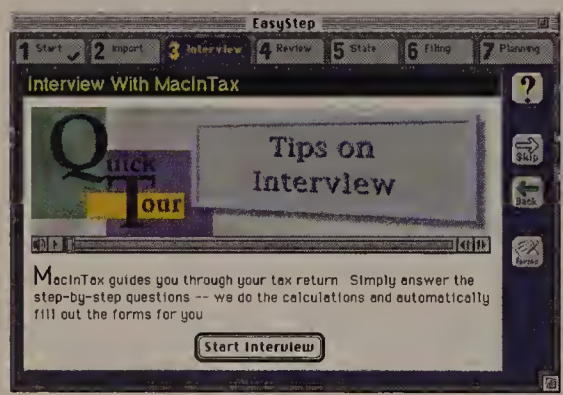
Tax Software

IMPROVED MACINTAX DELUXE AND KIPLINGER TAXCUT MAKE AN ANNUAL CHORE LESS TAXING

THIS TAX SEASON, IT'LL BE A little easier to choose a tax preparation package: Parsons Personal Tax Edge, one of the products in our last roundup (*Reviews*, April 1996), is no longer available for the Macintosh. The two remaining programs—Intuit's MacInTax and Block Financial's Kiplinger TaxCut—are closely matched, offering streamlined interview features that help you navigate the minefield of tax regulations. We looked at the planning versions of these programs; the final versions, which contain the IRS-approved forms required for filing, should be available by early February.

Different Approaches

The 1996 versions, like those in previous years, let you choose between the interview method, in which the program prompts you for information and fills in the tax forms automatically, and the manual method, where you enter the information yourself on electronic versions of the forms. Both MacInTax and TaxCut

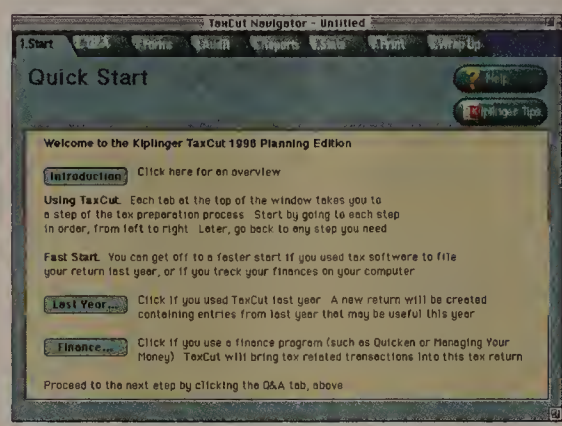


Tour Guide MacInTax intersperses tax advice with short videos designed to highlight an element of tax law or guide you through a sticky issue.

can also import data from a financial-planning program, and if you stick with the same tax program this year, it will transfer basic information into the current year's return. Either way, your taxes are calculated in seconds, and the results change automatically as you enter additional information. Once your return is completed, you can print it or, for a $9.95 service charge, have Intuit or Block file your return electronically.

Though their approaches to the interviewing process differ, both programs offer a "what-if" feature that lets you test several strategies to see which one results in the lowest tax, and both flag tax errors and entries that may trigger an IRS audit.

MacInTax's improved question-and-answer technique attempts to get more



Easy Access Kiplinger's TaxCut offers an accessible, easy introduction to the program.

information from you at the start of the interview process, so fewer questions need to be asked later on. From time to time you'll have the option of viewing a QuickTime movie that explains an aspect of tax preparation in more detail (see "Tour Guide"). Some of the clips offer valuable information, but others don't seem to go much beyond the sound bite category. The overall presentation is extremely professional, however, and takes much of the work out of preparing tax forms.

TaxCut has a revamped question-and-answer process, with a friendlier approach and less formal language than MacInTax's (see "Easy Access"). Another new feature is a more Mac-like interface; you can at last activate highlighted buttons by pressing return, and cut and paste material in data-entry fields.

The Amenities

MacInTax Deluxe comes on a CD-ROM, which, annoyingly, must be in the drive while you're using the program. (A $34.95 floppy-disk version includes all the necessary tax forms and basic help and interview information, minus the videos.) The PowerPC-native Deluxe version uses roughly 5MB of RAM and runs briskly enough, though occasionally it keeps you waiting while it retrieves data from the CD.

The Mac version of TaxCut isn't available on CD-ROM, nor is it PowerPC native, but performance was fine on my Power Mac 9500. I did, however, run into an occasional low-memory warning when I ran the program with its default setting of 1800K.

The state version of TaxCut is available only for California and New York. Intuit, on the other hand, offers state versions of MacInTax for every state with an income tax. And MacInTax includes an excellent 64-page manual that takes you through the basics of installing and using the program. In contrast, TaxCut's printed material is limited to a leaflet containing installation instructions. Both programs include the actual IRS instructions for each form, plus hints on handling particularly knotty aspects of your return.

The Last Word

MacInTax and TaxCut have been refined over the years to make tax preparation as trouble-free as possible, and now they're close enough in features and performance that you'll probably have a hard time choosing one over the other. If you live somewhere other than California or New York, prefer a little multimedia with your tax preparation, or need the greater range of online help a CD can provide, you may be better off with MacInTax.—GENE STEINBERG

Kiplinger TaxCut

RATING: ★★★★/7.1 **PROS:** Friendly interview process; well-organized, easy-to-follow online instructions; relatively brisk performance. **CONS:** Meager documentation; occasional low-memory warnings; state versions available only for New York and California. **COMPANY:** Block Financial (617/428-1119, *http://www.conductor.com*). **COMPANY'S ESTIMATED PRICE:** $29.95; state modules $24.95.

MacInTax Deluxe

RATING: ★★★★/7.7 **PROS:** Easy but comprehensive interview process; informative tax help; state tax modules for all states with income tax. **CONS:** Occasional slowdowns when accessing information from CD; somewhat RAM-intensive. **COMPANY:** Intuit (520/295-3110, *http://www.macintax.com*). **LIST PRICE:** $44.95; planning version $54.95; state modules $24.95.

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URL Managers

WHEN YOUR BROWSER'S BOOKMARK LIST JUST ISN'T ENOUGH

AT THE DAWN OF TIME—LATE 1993 or so, when bookmarking in browsers was truly primitive—I kept all 12 Web URLs in a SimpleText file in the Apple menu. When the Web exploded to 50 sites, I added 2 more files. As the Web grew, I began grouping my files into folders. I mention this bit of history to emphasize that if a commercial URL manager isn't easier to use than this approach, it's hard to justify paying for it.

Five new URL managers range from elaborate to basic. All capture and catalog URLs, e-mail addresses, and FTP sites for easy access, but some are significantly easier to use, faster, and more compact.

The Big Boys

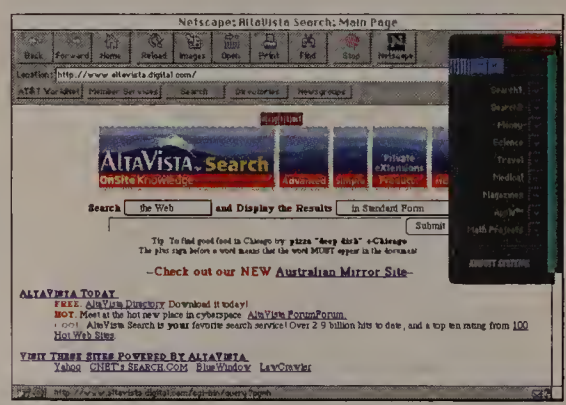
Eastgate Systems' Web Squirrel 1.06 keeps track of URLs using an elaborate filing system. Sites are kept in nice visual displays called "farms," and farm elements can be grouped into "neighborhood" lists—sort of a reinvention of the Finder's View by Icon. You can add URLs to farms using cut and paste or drag and drop; as with all the utilities reviewed here, double-clicking on an URL fires up your browser and takes you directly to that site. Web Squirrel also has an agent function that tracks and eliminates duplicate URLs. The question to put to this rodent, however, is how tracking URLs can take nearly as much RAM as ClarisWorks (running a browser, a PPP dial-up program, and Web Squirrel on a 16MB Power Mac is nearly impossible).

Another URL tracker with hefty RAM requirements is OnBase Technology's DragNet 1.1.4, a significantly more stable product than earlier versions. You drag and drop URLs into databases and locate them using a search function. If you have a big enough monitor, you can keep the Address, Directory, Hot List, and Searcher windows open and manage thousands of URLs quite easily. Of course, another approach is to consider a search engine your URL manager and avoid cataloging hundreds of URLs that are quietly turning into "file not found" errors behind your back.

Little Giants

Aladdin Systems, cleverly recognizing that the Mac already has a System and Finder, produced a control panel that creates a Finder-like environment outside your browser. CyberFinder 2.0 is unobtrusive, small, and incredibly stable. It organizes other online activities (e-mail, FTP, Gopher, and newsgroups) in their own separate folders. If you prefer to handle e-mail with Eudora, download files with Fetch, and read newsgroups with your favorite news reader rather than relying on your browser, CyberFinder is the utility you want.

Europasoft, meanwhile, developed a compact (380K) extension that produces its own Finder-level menu. Web Quick 1.2.1 simply follows your URL trail as you browse, organizing sites alphabetically in one pull-down menu and by the order visited in another menu. Site lists let you open URLs as if they were regular menu items, and you can drag URLs as hyperlinks into other applications. Web Quick eliminates duplicate URLs.



Channel Surfing Surfboard's simple channel clicker fits easily on a small screen and supports multiple sets of "channels."

Another utility with no learning curve is Abbott Systems' Surfboard, which appears as a remote control with pull-down menus (see "Channel Surfing"). You can create your own sets of buttons, and you add sites simply by clicking on the plus-sign button. Surfboard doesn't have its own database functions or CyberFinder's powerful non-Web options, and admittedly its presentation is something of a gimmick, but it works; Surfboard is a splendid example of interface design. Trust me, you understand channel-clicking better than you understand System 7.5. You may outgrow it when you become a Java-jiving Web pro, but Surfboard is a great place to start.

The Last Word

Both Web Quick and Surfboard are still on my system; Web Quick follows my trail, then I dump the URLs I want to save into Surfboard for easy access. But every product in this collection offers better bookmarking than either Netscape Navigator or Microsoft Internet Explorer. And at these prices, you can afford to add one or two to your collection.—CHARLES SEITER

CyberFinder 2.0

RATING: ★★★★/7.8 **PROS:** Bug-free; fast. **CONS:** Non-Web activities require planning. **COMPANY:** Aladdin Systems (408/761-6200, *http://www.aladdinsys.com*). **LIST PRICE:** $30.

DragNet 1.1.4

RATING: ★★★★/7.0 **PROS:** Good choice for managing huge URL lists; effective search system. **CONS:** RAM hog; multiple windows crowd small monitors. **COMPANY:** OnBase Technology (714/830-5682, *http://www.onbasetech.com*). **LIST PRICE:** $39.95.

Surfboard 1.0

RATING: ★★★★/8.0 **PROS:** Simple; intuitive; takes little screen space. **CONS:** Limited topic capacity on clicker. **COMPANY:** Abbott Systems (914/747-3116, *http://www.abbottsys.com*). **LIST PRICE:** $39.

Web Quick 1.2.1

RATING: ★★★★/8.2 **PROS:** Small; convenient; essentially no learning curve. **CONS:** None. **COMPANY:** Europa Software (503/417-2900, *http://www.europasoftware.com*). **LIST PRICE:** $49.95; $29.95 online.

Web Squirrel 1.06

RATING: ★★★/6.7 **PROS:** Powerful organizer based on hypertext file engine. **CONS:** Needs lots of RAM; duplicates and renames standard Mac features. **COMPANY:** Eastgate Systems (617/924-9044, *http://www.eastgate.com*). **LIST PRICE:** $49.

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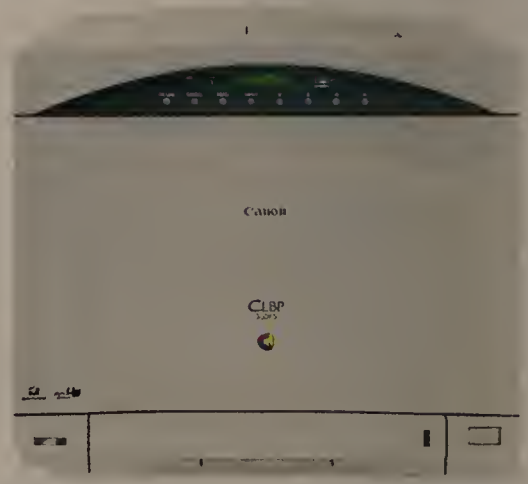

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Canon

Startup Manager 7.0

NOW'S ANEMIC EXTENSION UTILITY GOES SOLO

FROM THE FLAWED BLURB ON THE front of the box ("It's the first utility you'll *ever* need") to its buggy interface, Now Startup Manager (NSM) is disappointing. It's hard to understand why Now Software decided to break out this extension-management utility from the successful Now Utilities suite and market it as a stand-alone product.

Admittedly, NSM is a step up from Apple's own Extensions Manager. For example, it allows you to sort your start-up items by various criteria—loading order, installation date, and so on—and create a new loading order by dragging items up or down a scrollable list. It can also create a profile of your system, and it helps isolate conflicts by systematically turning off groups of extensions (starting with those most recently installed) and restarting your Mac until you nab the offending extension. (Now updates its conflict database on its Web site daily.)

Getting Started Now Startup Manager manages more than control panels and extensions. You can use it to load fonts, as well as plug-ins to programs such as Adobe Photoshop and Netscape Navigator.

NSM lets you manage more than just extensions and control panels. You can use it to manage alternate sets of fonts and to turn on or off at start-up selected third-party plug-ins (or groups or plug-ins) for programs such as Netscape Navigator and Adobe Photoshop.

But NSM lacks many of the features that make Casady & Greene's Conflict Catcher (CC) 3 so elegant. While CC allows you to switch between start-up sets and access other features via a menu-bar icon, NSM requires that you open the control panel itself to make adjustments. (You can also access the panel during start-up by holding down a key combination you define.) NSM's bland extensions list can't compare to CC's interface, which allows you to color-code start-up items. Listing and sorting options are also more limited with NSM: you can't list start-up items by the amount of RAM they consume, for example. And NSM lacks CC's Intuition feature, which lets you first target extensions you think might be causing a problem when hunting down a conflict.

NSM allows you to disable the display of icons during start-up, but doesn't show each item's name under its icon—something I've found useful with Conflict Catcher. And although you can switch between saved start-up sets with NSM, the program doesn't display the *name* of the active set during the start-up sequence (Conflict Catcher does).

Worst of all, I found NSM disturbingly buggy and unpolished. Its system profiling feature reported that the processor in my Power Mac 7200 was a 68020 chip instead of a 601—a goofy error. When I re-sorted my start-up items in the NSM control panel, Control Strip modules appeared in alphabetical order, even when I tried sorting them by other criteria. Also strange, the NSM Installer plunked a copy of the Now Startup Manager Guide in my Apple menu—even though launching the guide from there produces an error message. (The Apple Guide features must be accessed from within the control panel itself.) Finally, a printed manual will cost you another $10, and if you want floppy disks (instead of the CD-ROM), add another $3.95.

The Last Word

As one component of Now Utilities, Now Startup Manager is a passable extension-management tool, but it simply can't compare to Conflict Catcher as a full-blown stand-alone utility. When it comes to catching conflicts, Conflict Catcher is still king.—JOSEPH SCHORR

RATING: ★★/4.0 **PROS:** Manages fonts and application plug-ins; inexpensive; conflict database updated daily on the Web. **CONS:** Can't display names of loading extensions during start-up; buggy; no printed manual. **COMPANY:** Now Software (503/274-2810, *http://www.nowutilities.com*). **LIST PRICE:** $55.

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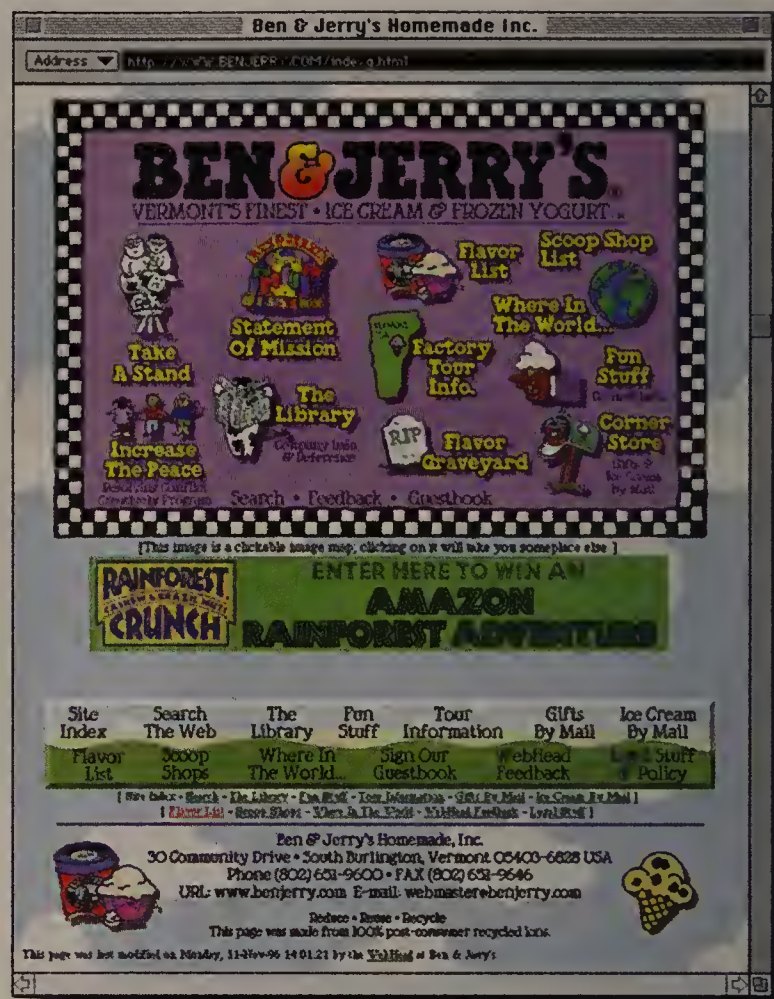
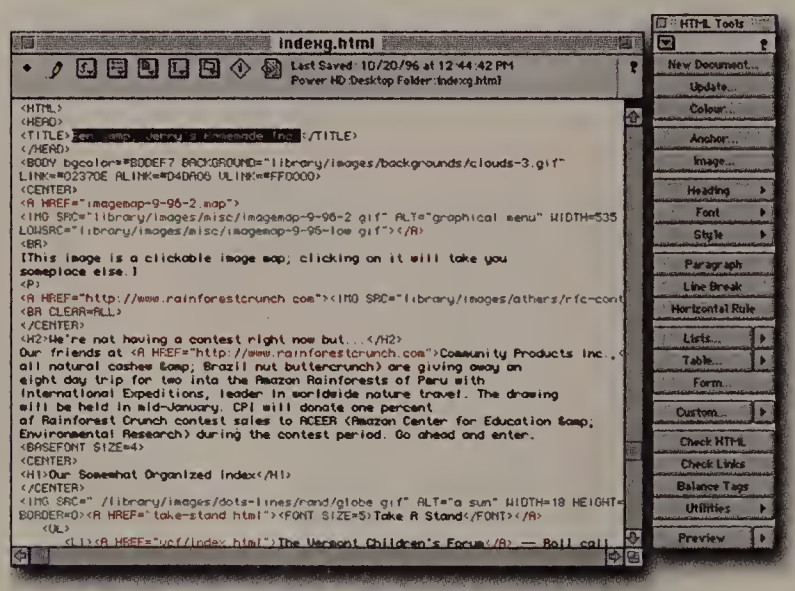


A page from **Ben & Jerry's web site** created using **BBEdit**.



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Mariner Write 1.3

ELEGANT, SPEEDY WORD PROCESSOR

A YOUNG ACORN OF A PROGRAM has sprouted in the forest of enormous, old-growth word processors for the Macintosh. Mariner Write 1.3 is a slim, fast writing machine that takes up just 990K of hard-disk space on a Power Mac, runs in 1250K of RAM, and launches three times faster than Microsoft Word 6. To the PowerBook owner, the RAM-starved, or any fan of the abandoned WriteNow, Mariner Write is a welcome reprieve from the bloated 25MB best-sellers.

Yet we're not talking about SimpleText here; Mariner's modern-day features include a movable tool bar, ten levels of Undo, seven degrees of magnification, kerning, split windows, WorldScript support, text-wrap around graphics, excellent import and export compatibility with major word-processor formats, and a WYSIWYG font menu. And then there's drag and drop—other programs also let you use your desktop to stash text and pictures dragged from a document, but now such efficiency comes in a $70 package.

Mariner Writing Mariner Write's menus are clean and carefully organized. Word 6 users might be startled to see the fascinating feature known as the Font menu.

All these features are implemented so cleanly and intelligently that it's hard to imagine needing the manual, balloon help, context-sensitive help, or text-only Apple Guide. Still, it's easy to see where Mariner ends and the $300 word processors begin: Mariner Write lacks a table-creation feature, envelope printing, a thesaurus, and a mail-merge command.

From those omissions, it's clear that Mariner Write's designers believe a word processor is for *writing*—not page layout, book creation, or number crunching. The program is crammed with surprising, unusual, and frequently charming features tailored to pure writing. A widow and orphan control, for example, prevents a single line of text from appearing at the top of a page; you can choose a text color *and* a background color; and you can select noncontiguous chunks of text. An Open Recent command lists the last eight documents you've opened, while a Dynamic Scrolling option lets you watch your text go by as you drag the scroll bar "thumb."

The program's menus reveal other treasures: four kinds of underlines, small caps, strike-through, and a style that puts a rectangle around text you've selected. Another menu lists worthwhile AppleScript commands, including one that highlights the active document's icon in the Finder. The Window menu commands neatly manage your open windows.

While this writer-centric rethinking of the modern word processor generally succeeds, some traditional features feel half-finished. For example, although the Find/Replace command is fast and clean, and a separate command lets you search for combinations of fonts and sizes, you can't search for styles or other formatting. And while Mariner can create a multiple-column layout, you can't vary the number of columns in a document; similarly, you get only one header per document.

The Last Word

For writers, this pleasant word processor's speed and size may well be worth a truckload of thesaurus and table-making features. Unfortunately, Mariner Write pales next to its real competition: ClarisWorks. For only another $60, that word processor offers similar speed and elegance—and spreadsheet, database, and graphics tools in the bargain.—DAVID POGUE

RATING: ★★★/6.9 **PROS:** Small, streamlined, and speedy; low RAM and disk requirements; reads and writes Microsoft Word files and many other formats; filled with useful, unusual touches. **CONS:** Lacks table, thesaurus, and mail-merge features; some features feel unfinished. **COMPANY:** Mariner Software (502/222-6695, *http://www.marinersoft.com*). **DIRECT PRICE:** $69.95.

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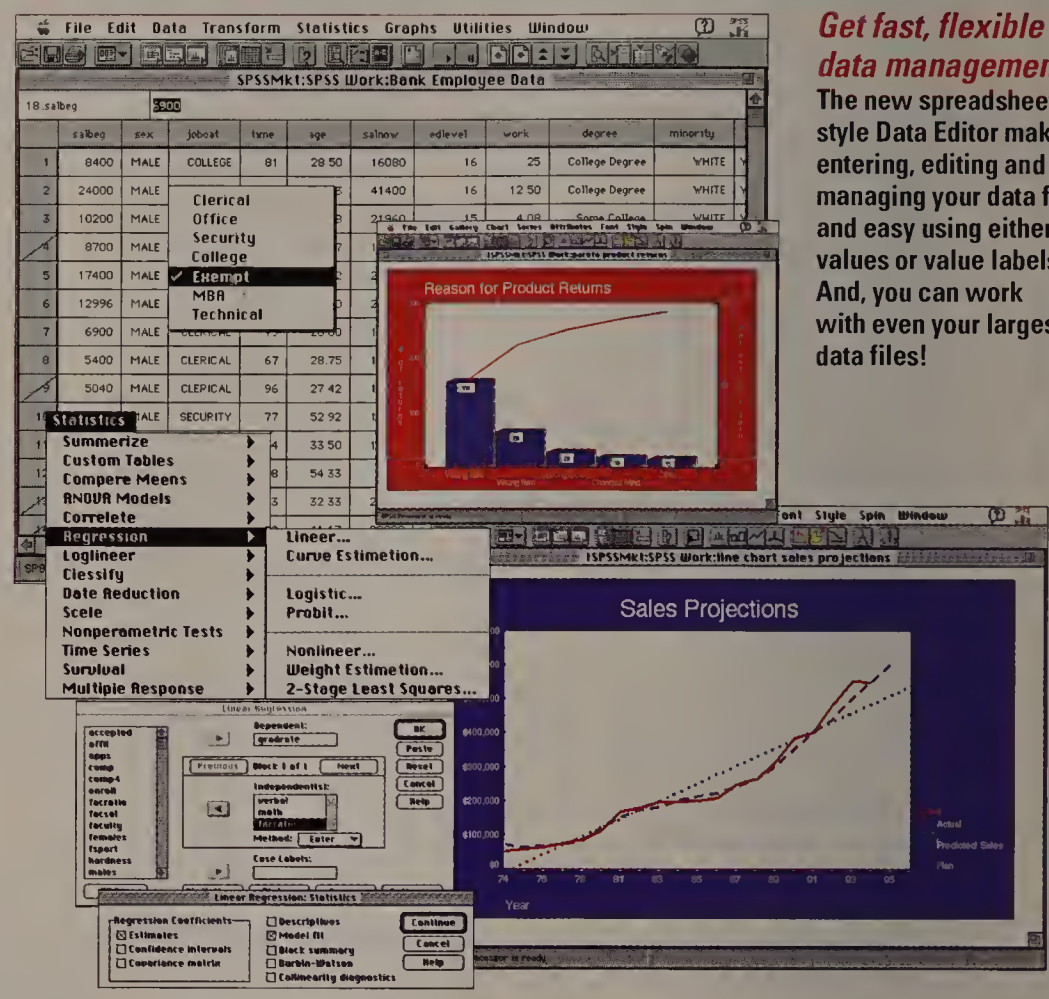

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QX-Tools 2.0

WINNING COLLECTION OF QUARKXTENSIONS GETS EVEN BETTER

RANGING FROM SOMEWHAT USEful to wildly powerful, the ten XTensions in QX-Tools 1.0 added new or improved functions to QuarkXPress (see *Reviews*, February 1996). Extensis has added five new tools to the collection, making QX-Tools 2.0 an even more appealing package for serious XPress users.

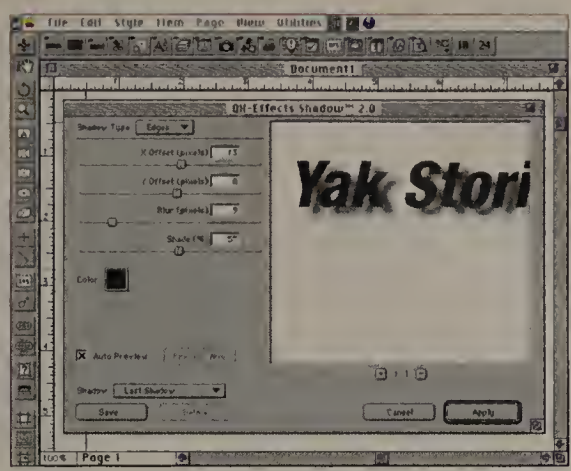
The new QX-FindChange tool is a powerful, much-needed replacement for XPress's own Find/Replace command. With QX-FindChange, you can search and replace not just by character and paragraph attributes, but by style sheet, color, box attribute, rule, frame, or line.

Another new gem is QX-FineTune, a turbocharged version of XPress's Measurements palette. With QX-FineTune you can tweak 28 paragraph, character, object, and rule specifications, either by typing in new measurements or by clicking on arrows to change settings in fixed increments. What makes QX-FineTune so powerful is that all these essential commands are gathered into one compact, tabbed palette. The price you pay for such convenience is that you can't undo QX-FineTune's formatting changes—not even those you can normally undo using XPress's standard commands.

But the most dramatic of the new tools is QX-Effects. This utility lets you add striking special effects, such as drop shadows and embossing, to text and picture objects from within QuarkXPress. This process would ordinarily require a separate image-editing program, such as Adobe Photoshop.

To add an effect to your page, you simply select an object and choose one of the four options—Bevel, Emboss, Glow, or Shadow—from the QX-Effects palette. You can preview the results and adjust the blur, shadow, and other settings (see "Drop a Shadow"). When you click on Apply, QX-Effects creates a new TIFF image containing the effect and places it on the page. The array of effects is impressive, and the preview window gives you excellent control over the results; but you'll need to boost XPress's memory allocation by at least 1MB.

The other new tools in the package are QX-CopyStyle, a useful palette that



Drop a Shadow QX-Effects' Shadow dialog box controls the offset, blur, and shade of a drop shadow.

lets you selectively copy paragraph, frame, box, color, and trapping attributes from one object to another, even across XPress documents; QX-DocStyles, a more powerful version of XPress's New Document command; and QX-SmartBar, a palette that watches how you work and builds a tool bar with buttons for the commands you use most.

Of the ten holdovers from version 1.0, the standouts are QX-Scaler, which lets you scale multiple objects in one step; QX-Styles, which adds character-based style sheets to XPress; and QX-Viewer, a palette that gives you a thumbnail view of each page, boosts XPress's zooming capabilities, and speeds up navigation within a document. Another original XTension, QX-Bars, offers customizable palettes and tool bars with buttons for accessing dozens of XPress commands. The tool bars can be overwhelming on small monitors, but you can customize them to make them smaller—or eliminate them entirely if you prefer.

The Last Word

At less than $7 per XTension, QX-Tools 2.0 is an undeniably great deal. Once you get used to the power this collection adds to QuarkXPress, you'll find it hard to live without.—JOSEPH SCHORR

RATING: ★★★★/7.8 **PROS:** Impressive special-effects filters and search-and-replace commands; more-accessible formatting tools. **CONS:** Can't undo some standard commands; palettes and tool bars clutter small monitors; increases XPress's RAM requirements. **COMPANY:** Extensis (503/274-2020, *http://www.extensis.com*). **LIST PRICE:** $99.95.

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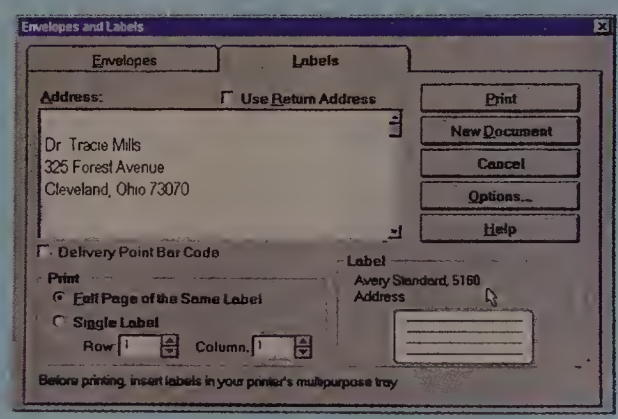

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Sagem Planet ISDN

GEOPORT TERMINAL ADAPTER BREAKS SERIAL PORT SPEED BARRIER

THERE ARE TWO WAYS TO GET ISDN connectivity to your Mac: connect its serial port to an ISDN terminal adapter (TA), or use Ethernet to access an ISDN bridge or router. The former has always been less expensive, but because it labors under the asynchronous serial port speed limit of 115.2 Kbps, it misses out on ISDN's full performance capabilities. The Sagem Planet ISDN GeoPort Adapter (SPIGA) circumvents this limitation by operating the serial port in synchronous mode.

SPIGA consists of an oblong pod that connects to the serial port of any GeoPort-equipped Macintosh on one end (drawing its power directly from the computer) and to an ISDN jack on the other, using a supplied RJ-11 phone cable. Non-GeoPort Macs require a special external power cable and AC adapter, neither of which is included.

A well-written quick-start guide walks you through the process of ordering an ISDN line and explains how to configure SPIGA and Sagem's supplied PPP dialer software. A user guide provides more detailed setup instructions and troubleshooting information. SPIGA's only other bundled software is Sagem's Serial2ISDN tool, which lets you use serial-port communications programs—such as the popular shareware application ZTerm—for file transfer. Sagem sells its own ISDN file transfer software, EasyTransfer, separately.

Setting up SPIGA for Internet access is a snap: you simply type the phone number of your Internet service provider into the Sagem PPP dialer along with your user ID and password, and click the Connect button. The dialer's panel displays ISDN call status in plain English, a boon for problem diagnosis. The PPP dialer has automatic calling and idle-time disconnect features, so you can configure it once and forget about it, letting the dialer make calls for you whenever you run an Internet application.

A single ISDN line has two 64-Kbps channels, each carrying a separate phone call. The ISDN GeoPort supports a feature called Multilink PPP that joins these two channels into a single 128-Kbps connection. You can switch speeds on the fly while connected to your Internet provider, a useful feature if your provider charges extra when you connect at 128 Kbps.

Some features found in other TAs are missing from SPIGA. Sagem offers no support for connecting analog devices—phones, modems, or fax machines—nor any built-in analog modem capability; you should hang on to your analog modem for the time being. Sagem supplies no Internet client software, so you must obtain a Web browser, e-mailer, and other Internet applications separately.

SPIGA sped past all other ISDN TAs we've tested, achieving FTP speeds of 15.5 Kbps—very near the theoretical ISDN maximum. Other TAs' serial port limitation, coupled with inefficient asynchronous signaling (which requires 10 rather than 8 bits per byte), limits them to about 12 Kbps for file transfers—giving SPIGA a 25 percent performance edge.

KEVIN CANDLAND

The Last Word

ISDN products have come a long way from the early days of complex configuration and operation. Sagem's Planet ISDN GeoPort Adapter is the first external ISDN terminal adapter designed specifically for the Mac, and that shows in its easy setup and the polish of its user interface. Although SPIGA lacks the analog line features and bundled software of other ISDN TAs, its best-of-breed performance makes it a winner for ISDN Internet access.—MEL BECKMAN

RATING: ★★★★/7.8 **PROS:** Low price; Multilink PPP support; dynamic bandwidth adjustment; easily configured PPP software. **CONS:** No power supply or cable for non-GeoPort Macs; no analog ports; no bundled Internet client software. **COMPANY:** Sagem USA (408/446-8693, *http://www.satusa.com*). **LIST PRICE:** $395.

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QuickSite

CLUNKY INTERFACE HOBBLES POTENTIAL WEB-DESIGN POWERHOUSE

ENVISION SUPERMAN WITH A chunk of Kryptonite around his neck, and you've got a pretty good picture of QuickSite, DeltaPoint's new program for creating and managing Web sites. Loaded with features and with a strong, database-oriented approach, QuickSite nevertheless has a clunky interface that places a huge obstacle between you and all that power.

DeltaPoint delivers on its promise that someone with no knowledge of HTML can use QuickSite, with its Site Construction and Page Design wizards, to build a Web site in a couple of hours. After you've created a home page with text and graphics, chosen the site's level of complexity, and set the overall graphic theme, QuickSite makes like Jane Jetson's automatic kitchen and whips up your Web site. The program creates a hierarchy of folders, linked pages, and graphic files; all that's left for you to do is customize the site. It's difficult to visualize how your site will look as you build it, however. You have to preview graphics using an external utility such as JPEG-View, and you can't see how they look together until the site is completed.

Clear as Mud QuickSite wears its database heart on its sleeve, confronting users with unfriendly lists of site resources.

If you're feeling adventurous, you can add tables, Java applets and scripts, and other complex elements to your pages. QuickSite has a graphical table-creation tool and comes with a library of basic Web items, such as a marquee Java applet, that first-time Webmasters will find useful. You add these elements to a page using the page-construction-and-editing tool, essentially a kludgy text editor with some macro capabilities added on. You can also add hand-coded HTML if you like. Once you're done tweaking the site, QuickSite handles the FTP negotiation involved in posting it to the hosting Web server.

Although QuickSite eventually coughs up entire folders full of HTML, it actually maintains a Web site as a collection of objects in a database. Everything from complete pages to individual links, paragraphs, and graphics becomes a palette of resources that you mix together to create your site. When you're ready to publish it, QuickSite compiles your database of elements, creating a set of folders containing HTML pages and graphics. This is a powerful premise: changing the look of an entire site—replacing the header image, for instance—is as easy as altering a single database record.

But QuickSite's innovative database underpinnings are also its tragic flaw. Instead of using the database to manage site elements behind the scenes, DeltaPoint confronts Webmasters with a decidedly unfriendly list view of the elements that make up their sites (see "Clear as Mud"). It's difficult to visualize the relationships between site objects, and it's even harder to imagine how objects will appear on Web pages (though QuickSite can quickly build a section of a Web site and send it to a browser for previewing).

Furthermore, the software is obviously a port of a Windows application, and the programmers were none too careful about observing Macintosh conventions. The result feels cobbled-together, peppered with bizarre 1-key equivalents and acres of quasi-modal dialog boxes.

The Last Word

I haven't seen anything that beats QuickSite for rapidly assembling the skeleton of a Web site, but its utility stops there; the program's potential charms are hidden in a maze-like interface. Nevertheless, I have to give DeltaPoint credit for being one of the first to produce what's sure to be the next generation of Web development tools—those that rely on databases to track sites.—CAMERON CROTTY

RATING: ★★/3.6 **PROS:** Software wizards build basic Web sites in a jiffy. **CONS:** Complicated, un-Mac-like interface. **COMPANY:** DeltaPoint (408/648-4000, *http://www.deltapoint.com*). **LIST PRICE:** $99.95.

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WebRamp

ISDN ROUTER LACKS SOME FEATURES

TRANCELL'S WEBRAMP ISDN router simplifies the process of putting an office LAN on the Internet with a setup wizard that walks you through the steps of connecting to an ISDN line, and thence to the Internet. But the WebRamp lacks advanced features found in other routers.

Along with the setup wizard, the WebRamp includes a built-in eight-port Ethernet hub, cables, a Macintosh installation guide, a user guide, and Netscape Navigator. You start out by running the setup wizard, which first presents information about WebRamp-savvy Internet service providers (ISPs) in your area and ISDN-line ordering instructions specific to your local telephone company. You must then contact both an ISP and your telephone company to arrange for service and obtain configuration information.

Armed with the necessary facts, you plug the WebRamp into your LAN and rerun the wizard, which locates the router and performs diagnostic checks. The wizard's graphical interface gives you pictures when you need them, offers extensive built-in help, and is much easier to use than the character-based interfaces of other ISDN routers. As you enter various ISDN and TCP/IP configuration values into dialog boxes, the wizard performs tests each step of the way and lets you know if it encounters problems. You finish by assigning IP addresses to all the machines on your LAN. Going online is now a completely transparent process: the WebRamp senses outbound Internet traffic and automatically dials your ISP; later it disconnects after a period of inactivity.

The entire process seems too good to be true, but it really does work, as long as your ISP is familiar with the WebRamp. In our testing, several ISPs had difficulty coming up with the necessary information to configure the WebRamp.

The WebRamp offers features common to other ISDN routers: dynamic bandwidth management, packet filtering to block outside access to your LAN, and alternate connection profiles for telecommuters. However, many advanced features found in other routers are missing from the WebRamp, including analog ports, data compression, AppleTalk or IPX routing or bridging, Distributed Host Control Protocol (DHCP) dynamic IP addressing, and LAN-to-LAN routing.

The WebRamp also lacks remote management capabilities. It allows a single Telnet session, through which you can enter text commands in a teletype-like environment, but it does not support Simple Network Management Protocol (SNMP) monitoring, remote firmware upgrades, remote message logging, or multilevel password security.

The WebRamp's diagnostic tools include five LEDs that show power, hardware errors, Ethernet activity, B-channel status, and WAN errors; eight other lights show the status of each Ethernet port. The WebRamp also includes a software-monitoring tool that shows the status of connections, as well as error messages. Unfortunately, this software caused problems with screen drawing in other applications, and the tool lacks any remote-control capability; you can't, for instance, command a disconnect through it.

KEVIN CANDLAND

The router performed well in throughput tests, easily moving large files at close to 16 KBps, ISDN's theoretical maximum speed. It also interoperated well with other brands of routers, including ISDN gear used by ISPs.

The Last Word

As a general-purpose Ethernet-to-Ethernet router, the WebRamp falls short. But if your local ISP supports it, the WebRamp offers a fast, easy way to get a corporate LAN on the Internet.—MEL BECKMAN

RATING: ★★★/6.4 **PROS:** Helpful setup wizard; built-in Ethernet hub. **CONS:** No AppleTalk or IPX protocol support; limited remote administration capabilities; no analog ports. **COMPANY:** Trancell Systems (408/988-5353, *http://www.trancell.com*). **LIST PRICE:** $899.

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Analytica

AN OPTIMAL APPROACH TO BUSINESS DECISIONS

LET ME STATE SOME PREJUDICES. To me, what makes a Mac worth having is not drop caps, nor talking icons of Sonic the Hedgehog, nor QuickTime thumbnails of your pet on the Web. The Mac's real payoff comes in the unique work of brilliant analytical toolmakers like Data Description (Data Desk), High Performance Systems (iThink), and Decisioneering (Crystal Ball). Decisioneering's new program, Analytica, falls into this category. Analytica 1.0.1 is not only the right computing tool for financial decisions, it helps you *think* more realistically.

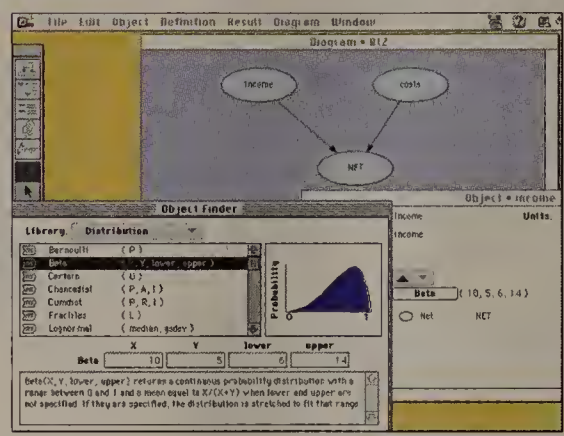
Consider one of the most basic decision models: estimating the net profit from a new venture. In general, you would make your best guesses at potential costs and income, choosing a single number for each, and then cross your fingers and plug the numbers into a spreadsheet. In a fancier case, you might do high and low estimates. Analytica, however, encourages you to think in terms of probability distributions—ranges of numbers for costs and income—instead of simply guessing single numbers.

In reality, your best estimate of income is—if you're talented or lucky—the most likely result in a probabilistic range. In real life, costs and net profit are also a range, not a single number. If you have great market and production data, you may have a narrow range of costs and incomes to consider, but the typical case is more uncertain.

Analytica lets you build a clear diagram that looks something like a traditional programming flowchart. The elements in the flowchart can be fixed quantities, quantities represented by distributions (you select the distribution from a pull-down menu in the element-definition dialog box), or quantities computed from your other already-defined elements (for example, net = income – costs). With a little practice, you can link elements to build a model almost as fast as you can think, and predict some valuable odds on your pet project before you bet the farm on it.

You could do something like this using Decisioneering's first product, Crystal Ball (an add-on to Microsoft Excel), and with considerable difficulty you could approximate Analytica's approach in a standard spreadsheet by testing dozens of values for each quantity. But Analytica's focus and diagrams really let you see and understand the key points of this kind of probability-based financial model without struggling with a clutter of spreadsheet machinery.

The program itself is close to perfection. Its support material, however, is not. The tutorials will be light reading for old Crystal Ball users (doubtless a large chunk of Analytica's market). Neophytes will learn how to connect Analytica elements—but not much else. There's little aid to understanding, for example, which distribution is the right choice for a given business situation, and most of the examples are too skimpy on details. This is a serious problem in a program of this kind, because the vast legions trained in decades of single-number-input spreadsheet calculations will need help reorienting their thinking to the new (and demonstrably better) distribution-based approach to business computing.



Graphic Realism Every unknown quantity in an Analytica financial model can be represented by a distribution instead of a single number.

The Last Word

If you have any professional responsibility for decisions involving money, buy Analytica and learn to use it. Once you understand Analytica modeling, you'll see why common spreadsheet single-number predictions in business are so often useless and misleading.—CHARLES SEITER

RATING: ★★★★/8.9 **PROS:** The best single decision-analysis program yet produced. **CONS:** Needs a *Dummies*-level tutorial. **COMPANY:** Decisioneering (303/534-1515, *http://www.decisioneering.com*). **LIST PRICE:** $795.

Day-Timer Organizer 2.1

PIM IS IMPROVED, BUT NOT PERFECT

AS A LONGTIME FAN OF DAY-Timer Technologies' paper-based planners, I was disappointed by the rough edges in the company's personal information manager, Day-Timer Organizer 2.0 (see *Reviews*, March 1996). I took another look at the latest release and found that it corrects many of its predecessor's deficiencies. However, you still can't set an alarm to go off before the day of an event, and you can't search the database without launching Organizer—an inconvenience if you don't have enough memory to keep the application running at all times.

Organizer 2.1 does have some nice improvements. Its address-book module has been updated with standard data-entry shortcuts like autocapitalization, autocompletion, and phone-number formatting. You can store e-mail addresses and Internet URLs along with other contact information, and launch your e-mail client or Web browser by clicking on a button. Importing data is now much simpler, with added support for comma- and tab-delimited text files and a new function that lets you match the fields in your database with entries in the import file. Other enhancements in version 2.1 include an improved banner display in the monthly calendar and additional printing options.

The Last Word

For many people, Day-Timer Organizer's familiar interface guarantees a smooth transition from a paper-based planner to a personal information manager. If you want to manage your schedule, contact, and expense information from a single application—and you're willing to live with Organizer's remaining shortcomings—it's worth a look.—FRANKLIN TESSLER

RATING: ★★★/5.4 **PROS:** New data-entry shortcuts; automatically launches e-mail client or Web browser; improved import functions. **CONS:** Can't set alarms before day of event; can't search database without launching application. **COMPANY:** Day-Timer Technologies (415/572-6260, *http://www.daytimer.com*). **LIST PRICE:** $79.95.

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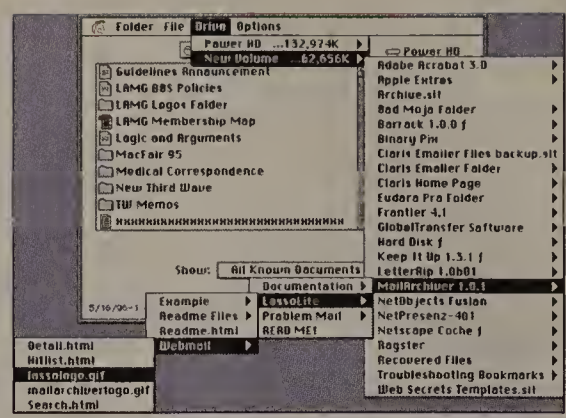
Now Utilities 6.5

INCREMENTAL FEATURE UPGRADES ARE NO SUBSTITUTE FOR STABILITY

SCANT MONTHS AFTER THE ADvent of version 6.0, another update to the venerable Now Utilities collection of system enhancements has arrived. This upgrade still isn't worth the fee for previous 6.0 and 5.X users, both because the new features are fairly minor and because Now Software has yet to fully address the package's stability problems.

The biggest change in this version is the upgrade of Now Startup Manager (NSM) to version 7.0. In a direct challenge to Casady & Greene's Conflict Catcher 3, NSM has been completely rewritten (see *Reviews*, in this issue.) While the new NSM has some innovative features, it's still no match for the more polished Conflict Catcher.

The three components added in version 6.0, Now AutoType, Now ShortCuts, and Now Tabs, have all received bug-fixes and enhancements. Now AutoType is faster and more reliable. It uses an improved method to trigger its text macros that allows macro expansion after punctuation without the additional keystrokes needed in previous versions. It also includes useful predefined macros. Unfortunately, a new bug causes AutoType to produce gibberish in Microsoft Word 5.1, unless Word's numeric keypad navigation feature is turned off.



Fast and Wide Access The indispensable Super Boomerang now lets you expand the Open and Save dialog boxes so you can see your document's entire name, and lets you access files that are up to ten folders deep with one mouse drag.

The lightweight Now Shortcuts and Now Tabs sport new plug-in modules, including modules that arrange and tile Finder windows, launch OpenDoc parts, and display useful information such as free space on a hard disk, or an IP address. But significant bugs remain. Now Tabs exhibited screen redraw problems and Shortcuts simply doesn't work sometimes.

Version 6.0's inadequate Installer program has been replaced; now you can choose individual components to install or remove. Now Scrapbook finally supports dragging and dropping images. Super Boomerang has a nifty new feature: it can expand the Standard File dialog so that long file names are no longer cut off. Documentation is still provided on the program's CD-ROM; you can order a paper manual for $10 or a set of floppy disks for $3.95. If you do get the manual, you'll find that it's too big to fit in the box, a needless annoyance.

The Last Word A new user of Now Utilities can easily be overwhelmed by all of the subtle modifications the package makes to your Mac. Most experienced users tend to use only the components they find valuable; of the 12, I use only Super Boomerang, Menus, WYSIWYG Menus, Scrapbook, and Startup Manager. The others don't pass muster because they are unimpressive, buggy, or both. Now Software would do well to quit adding features and work on improving the package's stability.—TOM NEGRINO

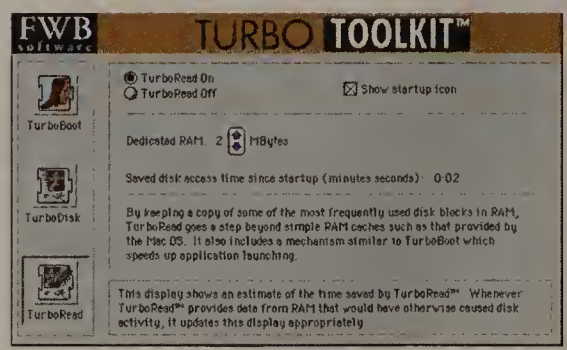
RATING: ★★★/6.4 **PROS:** The best modules (Super Boomerang, Menus) carry the weaker parts. **CONS:** Many components still have bugs. **COMPANY:** Now Software (503/274-2810, *http://www.nowutilities.com*). **LIST PRICE:** $89.95.

Turbo ToolKit

DISK UTILITY OFFERS MINOR SPEEDUP

THE STOPWATCH SHOWN ON TURBO ToolKit's package is there for a reason: you may need one to notice any improvement from this utility. The latest offering from FWB Software, Turbo ToolKit 1.0 is actually a set of three extensions—TurboBoot, TurboDisk, and TurboRead—designed to accelerate system start-up, optimize disks, and enhance application launching speed. Its interface is intuitive and the user guide is thorough, but that's where the praise ends.

FWB claims that on a Power Mac 7600 with more than 90 control panels and extensions, TurboBoot should reduce start-up time by 25 percent—from 55 seconds to 41. However, that represents only the elapsed time between when your Mac loads TurboBoot and when it loads the last control panel; in reality, if you take the entire start-up process into consideration, it takes twice as much time as what TurboBoot reports. What's worse, TurboBoot actually *increases* start-up time if Connectix's RAM Doubler is installed. I don't know about you, but I'd rather double my memory than shave seconds off start-up time.



Saving Seconds Doesn't Make Sense Turbo ToolKit's interface is clean, but the three components just don't deliver enough performance to justify the price.

Another extension, TurboDisk, can be invoked periodically (or during idle periods) to rewrite fragmented files into contiguous blocks on any volume larger than 10MB and smaller than 4GB. TurboDisk goes beyond simple defragmentation by placing the most frequently used files on the disk's outer tracks for faster access. Data is never in jeopardy because TurboDisk confirms that it has written a contiguous file before deleting the original. That sounds great, but TurboDisk is neither particularly easy to use nor particularly effective. To optimize a disk properly, you must run TurboDisk from another start-up volume. And despite what the manual says, you can't use a bootable CD or floppy—you need another hard drive or a removable disk. (FWB is aware of this problem and should have fixed it by the time you read this.) Unless you start with a seriously fragmented disk, it's unlikely you'll notice any significant improvement.

Turbo ToolKit's third component, TurboRead, caches the most frequently read blocks to memory, where the data can be retrieved more quickly upon subsequent requests. FWB claims that TurboRead makes applications launch faster, but that wasn't substantiated by testing or by Turbo ToolKit's own estimate of the amount of time saved, which is measured in mere seconds over the course of several hours.

The Last Word Although each of the Turbo ToolKit components does what it sets out to do, saving a few seconds here and there is a far cry from FWB's claims that the program turbocharges system performance. For about the same price, Power Mac users can get significantly greater performance boosts from Connectix's Speed Doubler 2 or a 256K cache.—OWEN W. LINZMAYER

RATING: ★★/4.6 **PROS:** Intuitive interface; thorough, well-written user guide. **CONS:** Marginal speed improvements; TurboDisk requires second volume for proper optimization. **COMPANY:** FWB Software (415/463-3500, *http://www.fwb.com*). **LIST PRICE:** $79.

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Poser 2.0

HUMAN MODELS IN 3-D (WITHOUT A FINE-ARTS DEGREE)

DRAWING THE HUMAN FORM REquires time and patience, commodities that most of us have in short supply. Fractal Design's Poser fills the gap by providing detailed human models ready to be positioned and modified using simple controls. With animation, higher-resolution models, and better import and export options, the new version has many of the features of expensive animation software—without the complex interface.

Poser's main window gives you a convenient studio in which you can arrange a model, props, a camera, and lights (see "Simplify Life"). To adjust a model's pose, you simply select the desired body part and drag it. Because the program uses inverse kinematics, you can pull on a model's foot and the entire leg moves naturally in relation to the rest of the body. If you need greater precision, you can enter the exact scale and dimension settings. The new version also lets you import any 3-D model as a prop and link it to a body part; a wig can be linked to a head, for example, so the two move in unison.

Simplify Life Poser's simple interface makes it easy to change the look of digital characters, select a predefined animation, and render the composition as a still image or movie.

Creating short motion studies is easy using the animation palette. You might want to start with one of the predefined sequences, such as walking, or you can let Poser record your changes to a pose, body part, camera, prop, or light, then generate the intermediate poses. Although Poser 2.0 isn't intended to replace stand-alone animation programs, it does have some high-end features—animated backgrounds, strong editing functions, and various quality settings for rendered movies.

While Poser 1.0 supplemented 2-D image-editing programs such as Fractal Design Painter and Adobe Photoshop, it didn't work well with modeling software because of its limited export options (see *Reviews*, October 1995). Poser 2.0, on the other hand, loads and saves popular 3-D file formats like 3DMF, DXF, and Wavefront OBJ; you can even replace a body part with an imported 3-D object (to draw Captain Hook, for example). Other new features in Poser 2.0 improve the quality of final images: multiple light sources give you better control over highlight and shadow details, you can now specify how surface details render, and an antialiasing option reduces harsh edges around models.

The Last Word Combining great figure-design capabilities with new animation and rendering features, Poser 2.0 is an excellent tool for artists who need a drawing guide and for multimedia designers seeking ways to enliven Web pages. Although its simple interface will appeal to beginners, it offers enough control to satisfy professional users.—MIKE HECK

RATING: ★★★★/8.1 **PROS:** Professional-looking models, simple inverse-kinematics animation; better import and export capabilities. **CONS:** Limited animation features. **COMPANY:** Fractal Design (408/430-4100, *http://www.fractal.com*). **LIST PRICE:** $249.

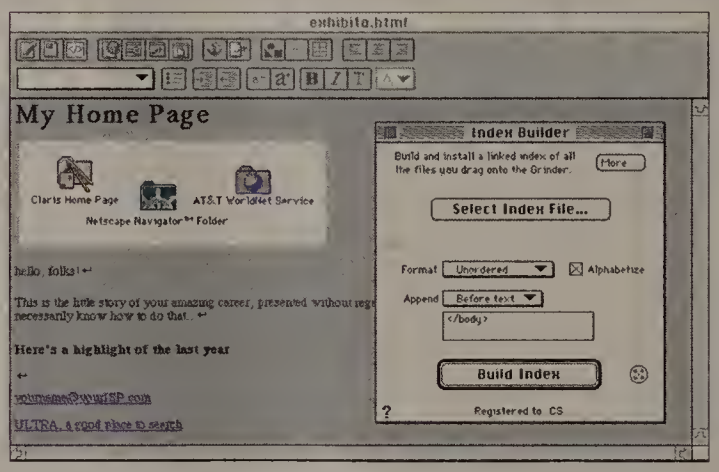
HTML Grinder 3.0

TOOLS AUTOMATE SITE MANAGEMENT

AUTOMATION MAY NOT BE AN issue for you if your HTML duties don't extend beyond maintaining a home page on America Online. If you're a freelance Web designer or in charge of a sprawling corporate site, however, you'll appreciate HTML Grinder 3.04, a collection of 18 utilities (called *wheels*) that automate repetitive, time-consuming tasks. You could automate some of those tasks just as easily using a freeware text editor, but most of Grinder's utilities quickly pay for themselves in saved coding time.

Most impressive are Grinder's site-organization tools: AutoIndexer generates a keyword-based index of your pages, Index Builder creates an index automatically from the file names you drag into a group (see "Daily Grind"), Sequential Linker adds Next Page and Previous Page links, and StretchList lets you add clickable "list triangles." Adding this level of indexing manually could take days, but with HTML Grinder it takes just minutes.

Another pay-for-itself utility is Theseus, which checks for invalid HTML syntax, missing links, pages with no links, and



Daily Grind The Index Builder "wheel" creates an index for HTML files you drag onto the Grinder icon.

a half-dozen other nuisances that are inevitable on large sites. A less flashy but equally capable wheel, Eight Dot Three, truncates entire batches of Mac-style file names to fit DOS file-naming conventions.

Another nice utility is Color Calculator, which looks up hexadecimal codes for background and text colors when you click in the Apple Color Picker. Other conveniences are a utility that prints your entire site and one that applies an AppleScript script to all your pages; you simply drag the collection of pages to the Grinder icon with the appropriate wheel selected.

Five or six of the wheels—such as Altifier, which adds Alt tags to images so text-oriented browsers can avoid downloading large graphics—automate tasks you could perform fairly easily using a text editor. Bare Bones' reliable BBEdit (*Reviews*, June 1996) and Nisus Software's QUED/M (*Reviews*, January 1997) are perfect for most utility-type tasks—and unlike HTML Grinder, they support Undo.

The Last Word If you write your own HTML rather than using a WYSIWYG authoring tool such as Adobe PageMill or Claris Home Page, HTML Grinder can cut down the time you spend embellishing and organizing your Web pages. It's not for "Here's a picture of my kitten" home pages, and not every user will need all the utilities it offers. If you use the Web to present a multitude of information, however, Grinder is bound to be one of your favorite programs.—CHARLES SEITER

RATING: ★★★/6.8 **PROS:** Very useful for site indexing and organizing. **CONS:** Some of its functions would be easy to duplicate using macros. **COMPANY:** Matterform Media (505/983-4189, *http://www.matterform.com*). **LIST PRICE:** $149.

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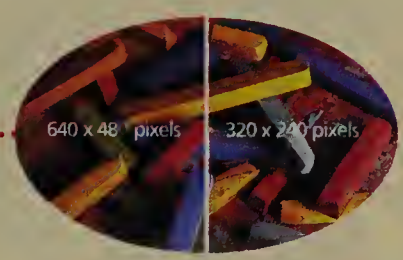

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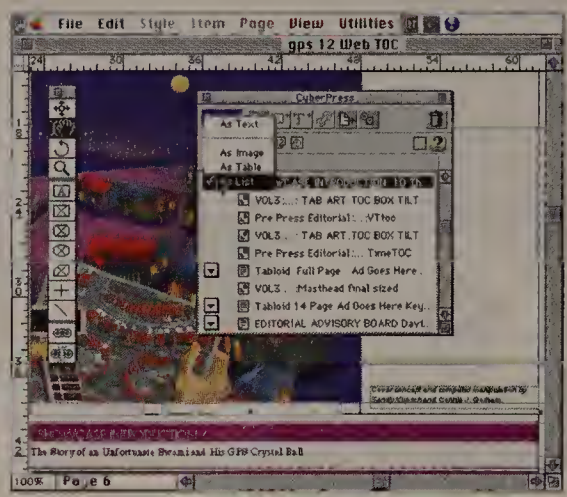
CyberPress

QUARKXPRESS TO HTML ON A BUDGET

AT THE MOMENT, THE BEST TOOL for turning QuarkXPress documents into Web pages is Astrobyte's BeyondPress 2.0. This powerful XTension lets you map XPress style sheets to HTML tags and export fully formatted Web pages from XPress (see *Reviews*, October 1996). But with a price tag of $595, BeyondPress isn't for everyone.

If you're looking for a less expensive way to make the journey from XPress to the Web, Extensis's CyberPress 1.0 is the ticket. Actually a scaled-down, low-budget version of BeyondPress, it's all you need to export XPress elements as Web-ready text and graphics—and it costs only $149.

At its core, CyberPress works just like BeyondPress. You select specific objects in a document—either text boxes or picture boxes—and add them to a palette. You can then drag the objects into any order and add simple elements, such as paragraph breaks and horizontal rules, before exporting them. CyberPress can also open the exported documents automatically in the browser of your choice so that you can see the results of your efforts, though you'll do most of your tweaking *after* the export process.



Making the List Using the CyberPress palette, you can export just the QuarkXPress text and picture boxes you want to include on your Web page.

Of course, at this price you're not getting several of the features that make BeyondPress impressive. You can't map style sheets to specific HTML tags, select chunks of text within a text chain and apply separate HTML tags to those selections, make exported GIFs transparent, or create image maps from pictures on the XPress page. In fact, you can't even preview your work in a browser before exporting it.

When you're ready to put the final touches on your HTML documents, you can use the outstanding WYSIWYG editing tools in Adobe PageMill 2.0 (included with CyberPress). At that point, you can make GIF images transparent, turn them into image maps, add new elements, add forms and frames, and so on.

While CyberPress lacks the power of BeyondPress, it has some superb features. It lets you add Web links to selected text within your XPress document and choose background and text colors before exporting it. You can also convert XPress text into HTML tables or lists on the fly. And although you can't map style sheets to HTML tags, you *can* map specific font sizes.

The Last Word CyberPress is a great deal; after all, PageMill 2.0 alone lists for $149. Its tool set may be minimal, but it's still powerful enough to streamline the process of converting content from XPress pages to Web pages. If your Web publishing efforts take off and you decide you need more power, you can always upgrade to BeyondPress for $449.95.—JOSEPH SCHORR

RATING: ★★★★/7.0 **PROS:** Inexpensive; exports HTML tables and lists; includes PageMill 2.0. **CONS:** Limited HTML-formatting options on export; can't preview elements before exporting. **COMPANY:** Extensis (503/274-2020, *http://www.extensis.com*). **LIST PRICE:** $149.

DynaTek CDM 4001

CD-ROM MASTERING MADE SIMPLE

ONCE CONSIDERED UNRELIABLE, CD-Recordable (CD-R) drives have become easier to use, but two major problems still exist: the reliability of your recording depends in large part on the speed of the drive used to copy data to the CD-R, and the recording process ties up your Mac. DynaTek Automation Systems' CDM 4001 solves both of these problems by combining a fast multimedia hard drive and a 4× CD-R mechanism within a single cube-shaped enclosure, with a dedicated data path between the two drives.

Under the CDM 4001's front-panel status lights is a CD-R drive capable of reading and recording CDs at speeds up to 4×. Hidden inside the enclosure is a fast multimedia 1.1GB hard drive. The back panel sports a single SCSI connector. An internal processor manages the recording process, eliminating interrupts and system bottlenecks caused by the Mac that can interfere with the process and turn your media into expensive coasters. The CDM 4001 comes with Astarte's excellent Toast CD-ROM Pro mastering software (see "Desktop CD Recorders," *Macworld*, September 1996).

GIBSON

To test the CDM 4001, I copied a large Adobe Photoshop file to the internal hard drive of my Power Macintosh 7500/100 and created copies on several CDs. When you initiate a recording session with a standalone CD-R drive, it copies data from your mastering drive to the recording mechanism, and you're forced to wait until the process is complete. But with DynaTek's unit, data is transferred directly to the CDM 4001's fast multimedia hard drive and *then* copied to the CD-R mechanism, allowing you to continue using your Mac during the process.

If you're mastering multiple copies of the same CD using a standard CD-R drive, you have to repeat the entire process for each additional CD. Using the CDM 4001, though, you simply insert another blank CD-R disc and press a button on the front panel to create a second copy.

The CDM 4001 also duplicates existing CDs easily. After you insert the master CD into the CD-R mechanism, pressing a single, conveniently located button copies the CD's data to the CDM 4001's internal hard drive. After the data is transferred, your original CD pops out and the drive is ready to receive blank CD-R media. A second button copies the data from the drive to the newly inserted blank media.

The Last Word If your CD recording is limited to occasional archives, the CDM 4001's added cost doesn't make sense, but its convenience makes it a standout for those whose business depends on the fast, reliable duplication and creation of CDs. The extra time you'll be able to spend on your Mac is certainly worth the price.—MATT CLARK

RATING: ★★★★/7.5 **PROS:** Quickly and easily creates one or more CD-ROMs; frees up the Mac for use during disc recording; simple CD-ROM duplication. **CONS:** More expensive than CD-R–only drives; not appropriate for general use. **COMPANY:** DynaTek Automation Systems (902/832-3000, *http://www.dynatek.ca*). **LIST PRICE:** $2889.

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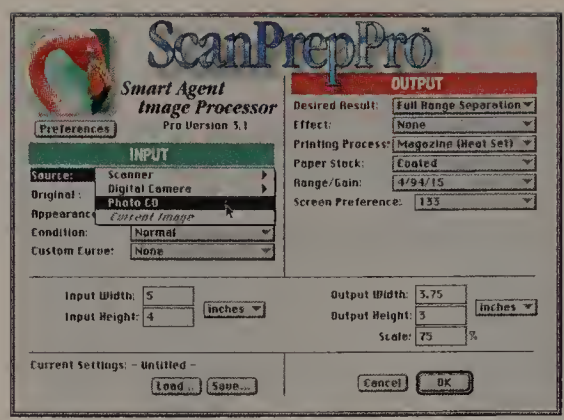
ScanPrepPro 3.1

PHOTOSHOP PLUG-IN PUTS IMAGE PROCESSING ON AUTOPILOT

THE IMAGE PREPRESS DANCE IS notoriously tricky, but ImageXpress's ScanPrepPro 3.1 makes the photo-Photoshop pas de deux as easy as putting one foot in front of the other. This Photoshop plug-in can automatically prepare digitized images for commercial printing or control the scanning, correction, and preparation of a print or transparency, frequently with remarkable results.

Running ScanPrep is a simple matter of answering a few relatively nontechnical questions concerning the original image and the desired output. For input, you indicate the type of source image (see "A Photo Finish"); whether the original is too light, dark, grainy, or blurry; if it has been screened; and its dimensions. For output, you specify the desired format—line art, halftone, color separation, multimedia image, fax, or RGB archive file—and the finished size (or scaling factor), printing process, and paper stock. Annoyingly, some settings reset others to their defaults if you enter them in the "wrong" order, and ScanPrep often drops digits when you enter the dimensions.



A Photo Finish ScanPrepPro begins by asking what type of image you're working with or what type of scanner ScanPrep will use to acquire the image.

ScanPrep calculates the optimal tonal range, screen frequency, and dot gain for you, but experts can easily override these settings and can now fine-tune such factors as UCR (under-color removal), stochastic screening, and unsharp masking, then save those settings for retrieval.

Using your scanner's own software in most cases, a suite of Photoshop manipulations, and ScanPrep's rewritten color-correction tables (or your custom tables), the program takes control of your scanner to produce a publication-ready image. ScanPrep can now ghost images 30 to 50 percent, pause to let you adjust color balance in a Photoshop dialog box, and create the most remarkably detailed 600- and 1200-dpi line art you've ever seen from a standard flatbed scanner. In addition, ScanPrep's ability to descreen screened images and convert images from color to rich, full-tone black and white is even better than in the last version.

Unfortunately, ScanPrep has three major shortcomings: it uses a hardware copy-protection key; there's no printed documentation, just a PDF-format electronic manual and a well-meaning but laborious instructional video; and it's expensive.

The Last Word Although ScanPrepPro can't turn a bad snapshot into a digital masterpiece, it can produce excellent images from reasonable originals and spare you the hassle of calculating scanning resolutions, line screens, scaling factors, and so on. Whether you're a novice or an old hand, ScanPrepPro is one of the most useful tools you'll find for preparing images for print or the Web.—ROBERT C. ECKHARDT

RATING: ★★★★/8.9 **PROS:** Automatically controls scanners and prepares images for printing; yields excellent results. **CONS:** Hardware copy-protection key; no printed manual; expensive. **COMPANY:** ImageXpress (770/564-9924, *http://www.scanprep.com*). **LIST PRICE:** $695.

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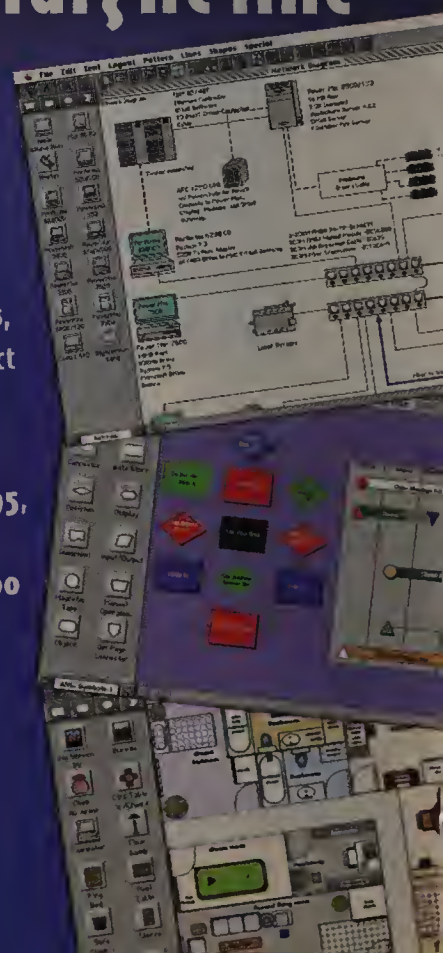

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AlphaSmart Pro 2.1

PORTABLE INPUT DEVICE OR CURE FOR POWERBOOK ENVY?

THERE SIMPLY AREN'T ENOUGH computers to go around in today's schools. One solution to this chronic problem is the AlphaSmart Pro 2.1, an intelligent keyboard that's designed to work as a stand-alone input device. This enhanced version of the original AlphaSmart keyboard has some refinements and new features that make it more versatile. And it's not just for students; it's a great data-collection and note-taking device for any mobile Macintosh user who wants to avoid the expense, weight, and security risk of a PowerBook. It's not as smart as a desktop Mac, but it's clever—and extremely handy.

The AlphaSmart Pro is about the size of a PowerBook, but it's half as thick and a quarter the weight. It can be used like a standard keyboard when it's plugged into a Mac; when it's not, two AA batteries or an optional rechargeable battery pack power the screen and memory. Unlike a typical portable computer, the AlphaSmart Pro is a power miser—a pair of alkaline batteries can keep it running for up to 200 hours.

The keys are responsive, quiet, and mostly full-size. As you type, the small LCD screen displays four 40-character lines of text. The screen isn't backlit, so it's difficult to read in dim light. The keyboard has enough memory to hold up to 64 pages of text in 8 fixed-length files, and a row of function keys lets you switch among the files.

ROBERT PERRY

The AlphaSmart Pro couldn't be much easier to use: you flip on the power switch, press a key to select a file, and start typing. You can edit with the arrow and delete keys, but serious editing is best saved until you've transferred the file onto your Macintosh. When you're ready to transfer the text, you connect the AlphaSmart to the Mac just as you would any keyboard. When you press the Send button, the file is poured into your word processor (or whatever application is active). The file remains in the AlphaSmart until you press the Clear File button to erase it. Unfortunately, the keyboard doesn't turn itself off when it's idle.

The AlphaSmart Pro can be configured for users with special needs—for example, it supports one-handed typing, the Dvorak keyboard layout, and multiple languages. Optional software allows it to transfer data faster and receive data from the Macintosh Clipboard, though most users will find that the keyboard meets their needs without any reconfiguration or additional software.

The Last Word AlphaSmart keyboards have been a fixture in schools since they were introduced in 1993, but the latest version has hundreds of applications outside the classroom. If you don't need a full-blown computer when you're away from your desk, the AlphaSmart Pro offers a low-cost, lightweight, hassle-free cure for PowerBook envy.—GEORGE AND BEN BEEKMAN

RATING: ★★★★/8.5 **PROS:** Inexpensive; lightweight; intuitive interface; minimal battery requirements. **CONS:** Small screen with no backlight; doesn't turn off automatically when idle. **COMPANY:** Intelligent Peripheral Devices (408/252-9400, *http://www.alphasmart.com*). **LIST PRICE:** $269; educational price $185 to $249.

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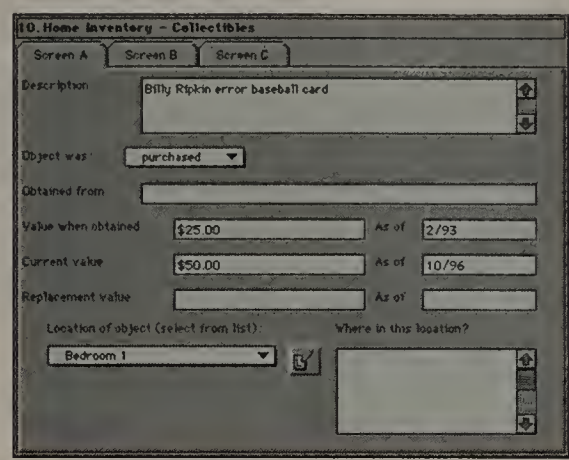
Personal RecordKeeper 4.0

DATABASE HELPS YOU KEEP TABS ON PERSONAL INFORMATION

IF YOU'VE GOT THE TIME TO ENTER information about personal, legal, and financial matters, Nolo Press has the place to put it. Personal RecordKeeper 4.0 is a database with predesigned forms for a wide variety of vital data, such as emergency information, insurance records, financial information, and personal documents. You can use Personal RecordKeeper for your own reference, making it a centralized source for your records, or print information for others, such as house sitters and pet sitters. Whether you want to compute your net worth or simply catalog family mementos, this comprehensive, well-designed program can help you organize information that's important to you.

Entering data is straightforward. You click on the folder icon for one of the 27 main categories, then select one of the subcategories listed. For example, you might choose Home Inventory, then Antiques, and fill in a record for each antique you own. You can enter a dollar value for each item and have Personal RecordKeeper print your home inventory as part of a net worth report. One restriction: the total dollar amount can't exceed $21,474,836.47—not a problem for me. (As the manual wisely suggests, "Hey, if you're worth more than $21 million, hire an accountant!") Although most of the entry forms can't be customized, they're well designed and thorough; many include multiple data-entry screens (see "Covering All the Bases").



Covering All the Bases Many of Personal RecordKeeper's categories offer multiple data-entry screens. Here, screen A lets you enter information about an item's value and location; screens B and C let you describe its care and insurance coverage.

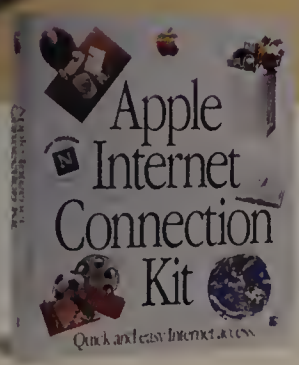
My main complaint is that I can't move an entire record from one subcategory to another. For example, I entered information for a lamp in the Antiques subcategory; when I decided it should go in the Collectibles subcategory, I had to open Collectibles and retype the entry.

Once you've entered information, Personal RecordKeeper lets you search the database, sort items, add cross-references among categories, and print reports. You can also export data to a word processor, spreadsheet, database, or Intuit's Quicken. If you wish to keep information confidential, you can password-protect a particular category or an entire database.

The Last Word Personal RecordKeeper is well designed, simple to use, and reasonably priced. Although I wish some of the forms offered more customization options, this flaw isn't serious enough to prevent me from heartily recommending the program to anyone who wants a place to consolidate and organize personal records.—ERFERT FENTON

RATING: ★★★★/8.9 **PROS:** Well organized; easy to use. **CONS:** Can't customize all data-entry forms; can't copy records from one subcategory to another. **COMPANY:** Nolo Press (510/549-4660, *http://www.nolo.com*). **LIST PRICE:** $49.95.

way to get on the Internet.



like, "This was so easy, why didn't I do this sooner?" The days of plodding along with complicated connections are over. With Apple, getting on the Internet now happens at warp speed. Visit your nearest Apple reseller, or order by calling 1-800-950-5382, ext. 1401. Apple. The power to be your best.

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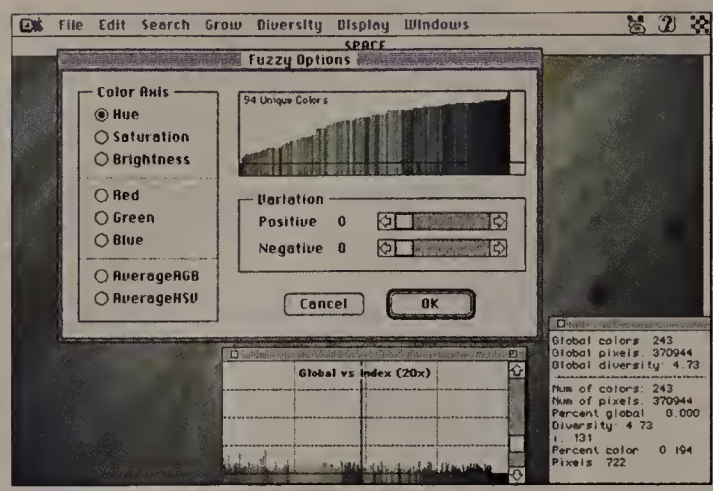
FullPixelSearch 2.0

IMAGE-ANALYSIS PROGRAM FINDS A PIXEL IN A HAYSTACK

JUST IMAGINE BEING ABLE TO pinpoint an oil rig in a satellite scan of Texas, a minute fracture in an ultrasound scan of a welded part, or anomalies in an MRI scan of a corpus callosum. Avian Systems' FullPixelSearch 2.0 lets you search for a tiny piece of a medical or scientific image—something none of the more notable programs in the image trade, such as Adobe Photoshop, can offer. This specialized program isn't for everyone—for example, you wouldn't use it to search Web graphics—but in the right hands it's extremely useful.

The most important new feature in version 2.0 is "fuzzy" searching. To understand what that means, consider what happens when you search for a word in a document: you look for an exact match of a set of letters, each of which is stored as an 8-bit value. To match a piece of gray-scale or 8-bit-color image, however, you need to allow for inexact matches arising from differences in image digitization. Besides digital color variation, the search has to allow for spatial distortions of the pixels. FullPixelSearch's implementation of fuzzy matching is impressive not only for its wide, easily selected range of conditions (see "Purple Haze"), but also for its speed; a less clever search algorithm could take a week to fuzzy-search a mere snapshot scan.



Purple Haze The "fuzz" in FullPixelSearch's fuzzy image searching lets you pick color ranges rather than exact colors in your target image (such as the chunk of Jupiter's atmosphere shown here).

Another significant improvement over version 1.0 is the ability to lasso irregularly shaped areas for the search template. After all, neither a kneecap nor the Great Red Spot is a square image.

You can't beat Avian Systems' technical support: the scientist who wrote FullPixelSearch answers your e-mail. Users are taking advantage of this direct contact to demand batch processing (the most important missing feature), in-program conversion of JPEG and other graphics-file formats, and the ability to search on 24-bit images (which aren't that common in medical or scientific applications). Given the high level of user-developer interaction, there's a good chance these enhancements are already in place as you read this.

The Last Word Professionals who analyze images need FullPixelSearch 2.0; it makes possible a wide range of medical and scientific image studies that would otherwise be prohibitively tedious. There's nothing else like it, and it brings real innovation to a field that's been using variations on the same old techniques for decades.—CHARLES SEITER

RATING: ★★★★/8.3 **PROS:** Great implementation of fuzzy search mode; first-rate support. **CONS:** Desperately needs batch mode. **COMPANY:** Avian Systems (201/568-9494, *http://www.ldeo.columbia.edu/~podolsky/*). **LIST PRICE:** $295.

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MacUser RATED SEPTEMBER 1996

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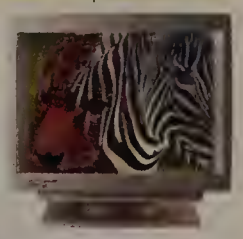

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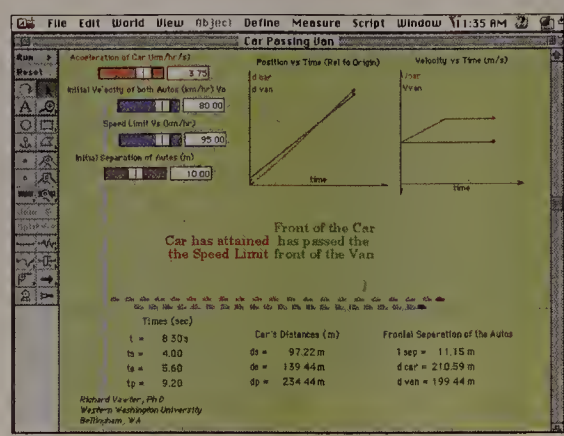
Interactive Physics 3.0

NEARLY AUTOMATIC PHYSICS INSTRUCTION FOR HIGH SCHOOLS

AMERICA'S MASSIVE INVESTMENT in classroom computers has made first-rate instructional software a national priority. A ray of hope has appeared in the form of Interactive Physics, the instructional companion to Knowledge Revolution's Working Model engineering software (see *Reviews*, December 1995). Geared toward the high school level, Interactive Physics lets students build computer simulations of laboratory experiments and large-scale events.

Interactive Physics 3.0 is PowerPC native and the fastest version yet—and if you're willing to sacrifice some numerical accuracy, you can run the simulations even faster in the nondefault mode. The new version also has more tools, including a new curved-polygon body type and Join/Split and Object Snap features that help you build complex mechanisms. It's now easier to draw curved slots for mechanisms, and you can adjust most physical parameters with sliders. Not only can you set up and recall data for simulations from Microsoft Excel, but Interactive Physics can now access and run external scripts.



Passing Lane If you'd had a physics instructor as good as Richard Vawter, who contributed this Interactive Physics demo on acceleration and velocity, you might be a rocket scientist today.

These capabilities may seem like overkill for high school physics, but they let instructors produce specialized combinations of data and scripts to illustrate basic physics concepts in detail (see "Passing Lane"). The performance and quality of these instructional demos (the package includes 20 or so) make Interactive Physics 3.0 more useful than its closest competition in the physics problem-solving field.

Interactive Physics has only a few minor imperfections: some Mac conventions are implemented oddly (for example, 1-R means Run, but it also means Stop if something is running), and the labor involved in simulating a big gears-and-linkages mechanical model is nearly comparable to that needed to master a CAD program. Fortunately, the abundant teacher-contributed demos give you a good head start on understanding complex mechanics.

The Last Word With Interactive Physics, Knowledge Revolution shows us how good instructional software can be. It doesn't replace a real physics lab and a good teacher—in reality, there are no perfectly elastic collisions, ideal springs, or any of the other beginning-physics concepts designed to simplify calculations—but it's a great companion. Let's just hope that physics students will continue to see real metal springs disobeying Hooke's Law.—CHARLES SEITER

RATING: ★★★★/8.3 **PROS:** Fast execution; PowerPC native at last; helpful new tools; useful selection of teacher-contributed demos. **CONS:** Setting up some mechanisms takes considerable practice. **COMPANY:** Knowledge Revolution (415/574-7777, *http://www.krev.com*). **LIST PRICE:** $249; educational discounts available.

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Circle 43 on reader service card

Police Quest: SWAT

SIERRA'S ACTION-ADVENTURE MISFIRES

DESIGNED BY FORMER POLICE CHIEF Daryl Gates—the founder of the original Los Angeles Police Department SWAT team—Police Quest: SWAT could have been a realistic urban adventure. Unfortunately, despite its potential, this game shoots itself in the foot.

The latest game in Sierra On-Line's Police Quest series begins with a tone-setting sequence that's more like an encyclopedia of SWAT history, weapons, and tactics than a game. Toward the end of this information-packed interactive segment, you get to unload a few rounds using various weapons in a firing range.

After completing your training, it's time to switch CDs and prepare for your first mission. If you're running System 7.5.3, though, you'll have some problems—the first is an annoying screen freeze when you change discs. Audio frequently runs seconds behind the video, and other glitches spring up along the way. Sierra's support team recommended switching off extensions and increasing virtual memory, but the game remained buggy. Updating to System 7.5.5 ultimately took care of most problems.

Friendly Fire The difficult-to-master sniper rifle offers one of Police Quest: SWAT's few diversions.

After you finish tweaking your system, you face another problem: Police Quest: SWAT's interface is virtually impenetrable. The game appears to have been ported directly from the PC version, and its designers poorly compensated for the Mac's lack of a two-button mouse. After 15 attempts—in which I frequently shot my team leader or got blasted by the bad guys for running into areas I had no intention of exploring—I was ready to give up.

SWAT's movement, communications, and weapons interfaces are separate elements, and you're forced to switch between them during missions. In a game where response time is important, one wrong mouse-click can cost your life.

Even if you do master its tricky interface, SWAT doesn't offer the tense, exciting atmosphere you'd expect from a police adventure. Because the game relies on eye-catching full-motion video, game play follows a rigid format that doesn't let you try new approaches. You're trapped in a set script—a design flaw more lethal than a burst of automatic-weapons fire.

SWAT's soundtrack is a strong candidate for improvement, too. Pseudomilitary theme music accents the training phase, but mission sequences have no background at all. A simple tune might've given the game an edge it sorely lacks.

The Last Word Police Quest: SWAT is seriously flawed by a cryptic interface, an inexcusable reliance on full-motion video, and an inability to run on any but the most recent system software. Its lackluster atmosphere puts the final nail in its coffin. I'd hesitate to recommend this game to anyone.—DANIEL MADAR

RATING: ★★/3.0 **PROS:** Interesting material on SWAT history and tactics. **CONS:** Impenetrable interface; problems running under System 7.5.3; rigid game play. **COMPANY:** Sierra On-Line (206/649-9800, *http://www.sierra.com*). **COMPANY'S ESTIMATED PRICE:** $49.95.

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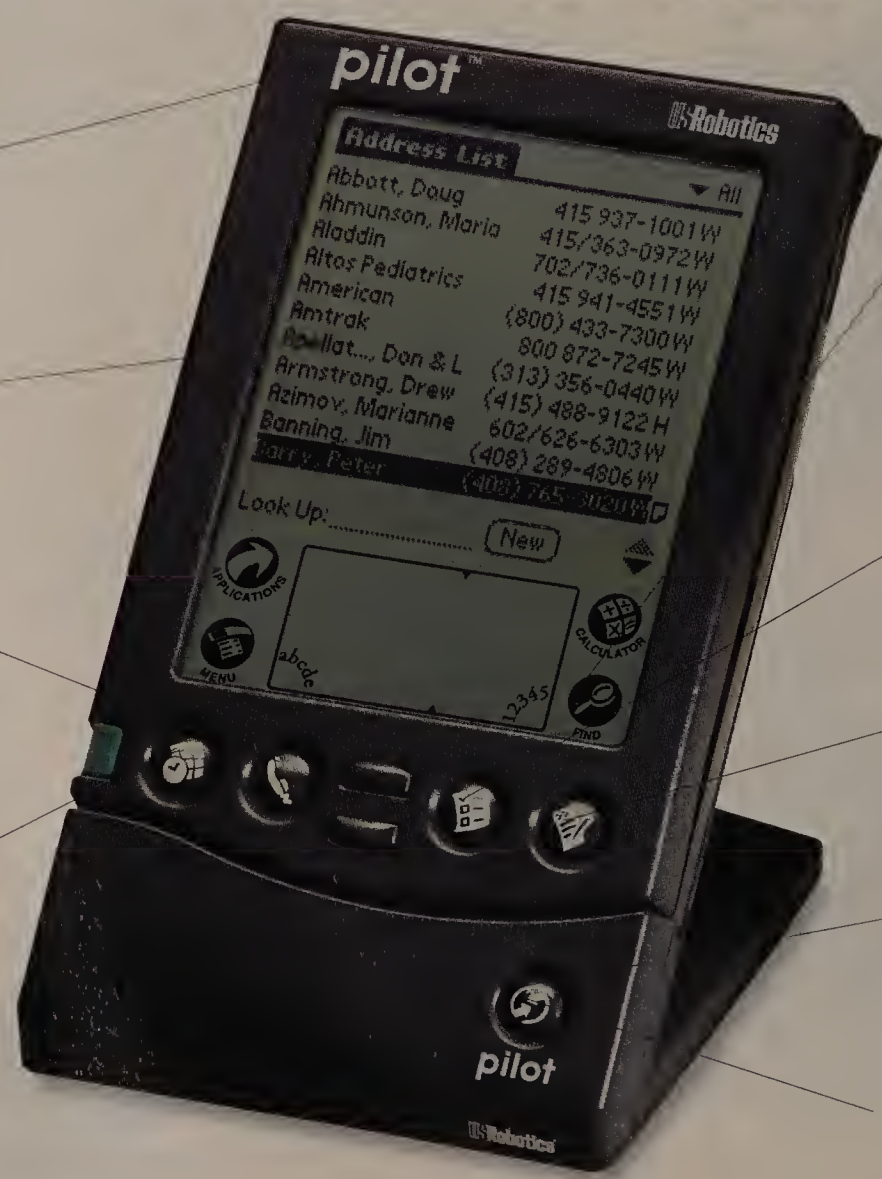

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Pilot stores thousands of addresses, phone and fax numbers, personal notes — you name it.

Touch here to see the day's agenda. Make recurring meetings appear automatically.

Delete old records from your Pilot, and keep for future reference in an archive file on your Macintosh.

Enter any word and touch "Find" to retrieve a stored item instantly.

It's easy to add memory, upgrade software, or in the future, attach products like modems.

Prepare a To-Do list, prioritizing items by due date. Make items disappear as you complete them.

Take notes on the road, then later copy and paste them into programs like Word and Excel on your Macintosh.

Enter data once into your Pilot or Macintosh. Then press the HotSync™ button to keep your Pilot and Macintosh up-to-date.

One touch automatically keeps the data on your Pilot safe and backed up on your Macintosh.

At about 4.5" tall, and 5.5 oz. and at $299,* the new Pilot organizer fits your shirt pocket — and your budget. Yet it's huge on functionality. But instead of telling you all it can do, we think you'd rather try it out yourself. To find out where to get your hands on one, give us a call at 1-800-881-7256. To arrange a demo, visit our web site at http://www.usr.com/palm.

pilot™
The one touch organizer

*The average U.S. street price for Pilot 1000, complete with all desktop PIM software and organizer software, docking cradle and accessories. Additional Mac Pac required at $14.95. © 1996 U.S. Robotics, Inc. U.S. Robotics and the U.S. Robotics logo are registered trademarks and Pilot and HotSync are trademarks of U.S. Robotics and its subsidiaries. All other product names are registered trademarks or trademarks of their respective owners

U.S. Robotics

Star Ratings

HARDWARE AND SOFTWARE PRODUCTS AT A GLANCE

Macworld's Star Ratings let you compare Macintosh products based on the authoritative assessments in our reviews and features.

What the Scores Mean The number of stars indicates the product's level of quality; each product also gets a numeric score that provides a more exact assessment of the product's quality within that level. The chart below shows the meaning for each level.

We evaluate seven factors to derive the Star Rating: feature set, design implementation, performance, reliability, ease of use, innovation, and value. We take these evaluations, weight their importance for each class of product, and calculate the final score. The higher the score, the better a product is, even among products with the same number of stars.

Editors' Choice This section also lists products that have been awarded an Editors' Choice designation in a *Macworld* product comparison. That designation indicates a best-of-class product for a particular need.

Ratings Online The ratings listed here are of recently reviewed products in select categories. For a complete, searchable list, go to Macworld Online, at *http://www.macworld.com/pages/star/ratings.html*.

Full Reviews To read a full review of any product in the listing, please consult the issue indicated at the end of the listing or search for the product via Macworld Online (keyword *Macworld* on America Online; URL *http://www.macworld.com* on the World Wide Web). If a product has been upgraded since our last assessment, the most recent version number appears in parentheses after the main reviewed version number.

Vendors: Please write to Macworld Star Ratings, 501 Second St., San Francisco, CA 94107, to inform us of changes in the version number or list price of your product, or of changes to your phone number.

Software

BUSINESS

★★★★/7.9 **Big Business 2.0,** Big Software, 408/725-7200, $199 to $999. All-in-one business application integrates sales, marketing, ordering, and accounting. *Jan 97, p. 64*

★★★★/8.1 **Claris Organizer 2.0,** Claris, 408/727-8227, $69. Solid upgrade is worth the wait. *Jan 97, p. 62*

★★★★/8.4 **ClarisWorks 4.0,** Claris, 408/727-8227, $129 (estimated). The program has speed, a clean design, and low resource requirements. *Jun 96, p. 98*

★★★★★/9.5 **DeltaGraph 4.0,** DeltaPoint, 408/648-4000, $195. Top Mac graphing application still excels. *Sep 96, p. 90*

★★★/6.3 **Map Factory,** ThinkSpace, 519/858-5047, $996. Unique raster-based mapping program. *Nov 96, p. 70*

★★★★/7.1 **Microsoft Excel 5.0,** Microsoft, 206/882-8080, $295 (estimated). Although it's the only game in town, Excel 5 is a glutton for RAM and disk space. *Jun 96, p. 98*

★★★/6.7 **Microsoft Word 5.1,** Microsoft, 206/882-8080, $320 (estimated). Fast, sleek, stable, and probably the most widely used Mac word processor on earth. *Jun 96, p. 98*

★★★/6.9 **Quicken Business Law Partner 2.0,** Parsons Technology, 319/395-9626, $49. Suffices if you want to get the job done with a minimum of fuss. *Feb 97, p. 84*

★★★★/8.7 **Quicken Deluxe 7.0,** Intuit, 520/295-3220, $59.95. Indispensable financial manager. *Feb 97, p. 64*

★★★★/7.6 **Small Business Legal Pro Deluxe 2.0,** Nolo Press, 510/549-1976, $59.95. A great value if you want to be fully informed. *Feb 97, p. 84*

★★/4.5 **Street Atlas USA 3.0,** DeLorme Mapping, 207/865-1234, $79. Map program update is better and cheaper, but still flawed. *Nov 96, p. 100*

★★★/5.1 **TakeNote 1.0,** Academix Software, 415/493-3003, $79.95. Reference tool goes halfway to replacing the familiar index card. *Jan 97, p. 88*

★★★★/7.1 **Timeslips 4.0,** Timeslips, 214/248-9232, $299.95. Time-tracking and -billing package is unnecessarily complex. *Jan 97, p. 86*

★★★★/7.4 **WordPerfect 3.5,** Corel, 613/728-8200, $129 (estimated). In speed, interface efficiency, and Macintosh integration, WordPerfect beats all competitors. *Jun 96, p. 98*

GRAPHICS

★★★★/7.1 **Adobe Illustrator 6.0.1,** Adobe Systems, 415/961-4400, $595. Efficient and well-organized drawing program doesn't surpass FreeHand 5.5. *Jan 97, p. 112*

★★★/5.7 **Canvas 5.0,** Deneba, 305/596-5644, $599.95. Midrange graphics program has professional price. *Jan 97, p. 112*

★★/4.8 **Chromatica,** Chroma Graphics, 415/375-1100, $149.95. This Photoshop plug-in is handy but limited. *Feb 97, p. 80*

★★/4.6 **CorelDraw 6 Suite,** Corel, 613/728-8200, $595. Graphics suite lacks solid image-editing and drawing programs. *Jan 97, p. 112*

★★★★/8.9 **Detailer,** Fractal Design, 408/430-4000, $449. Wonderful imaging tool lets you paint directly on 3-D models. *Feb 97, p. 72*

★★★★/7.8 **ElectricImage Broadcast 1.0,** Electric Image, 818/577-1627, $2495. 3-D animation tool gets new price, new features. *Nov 96, p. 88*

★★/4.7 **Fastedit/Deluxe,** Total Integration, 847/776-2377, $249. Photoshop plug-in lets you edit quickly, but is expensive. *Nov 96, p. 92*

★★★★/7.5 **Form-Z RenderZone 2.8,** Autodessys, 614/488-9777, $1995. Impressive 3-D modeler gets rendering know-how. *Oct 96, p. 75*

★★★★/8.7 **FreeHand 7,** Macromedia, 415/252-2000, $399. Near-perfect draw program. *Feb 97, p. 56*

★★★★/7.9 **FreeHand Graphics Studio 7,** Macromedia, 415/252-2000, $449. Suite provides professional-level power at an affordable price. *Feb 97, p. 56*

★★★★/7.9 **Infini-D 3.5,** Specular, 413/253-3100, $649. Approachable, practical mix of 3-D design ingredients. *Jan 97, p. 70*

★★★★/8.3 **Kai's Power Goo,** MetaTools, 805/566-6200, $49.95. Family image-editing software that pros will use. *Jan 97, p. 84*

★★★★/7.7 **Paint Alchemy 2.0,** Xaos Tools, 415/487-7000, $199. Photoshop filter applies brushstrokes to create impressionistic effects. *Sep 96, p. 120*

★★★★/8.9 **Painter 4.0,** Fractal Design, 408/688-5300, $549. Most artists should own Painter 4.0; its painting and special-effects capabilities simply can't be beat. *Jun 96, p. 78*

★★★★/7.7 **PhotoMatic 2.0.1,** DayStar Digital, 770/967-2077, freeware. Photoshop filter adds batch processing and AppleScript support. *Sep 96, p. 120*

★★★/6.9 **PhotoNavigator 1.0,** Extensis, 503/274-2020, freeware. This Photoshop filter provides a thumbnail view of an image for quick and easy scrolling. *Sep 96, p. 120*

★★★★/8.3 **Photoshop 4.0,** Adobe Systems, 415/961-4400, $895. New version cements image editor's position as the top product. *Feb 97, p. 132*

★★★/5.7 **PhotoTools 1.0,** Extensis, 503/274-2020, $99.95. Useful Photoshop plug-in. *Feb 97, p. 80*

★★★/6.2 **PlateMaker 1.0.2,** A Lowly Apprentice Pro-

continues

REAL PRODUCTS REAL RATINGS Reviews you can trust: Unlike other publications, Macworld rates only final shipping products, not prototypes. What we review is what you can actually buy.
Outstanding ★★★★★ = 9.0–10.0 Very Good ★★★★ = 7.0–8.9 Good ★★★ = 5.0–6.9 Flawed ★★ = 3.0–4.9 Unacceptable ★ = 0–2.9

Star Ratings

ductions, 619/438-5790, $295. This Photoshop filter exports CMYK with spot-color channels to DCS 2.0 format. *Sep 96, p. 120*

★★/4.4 **Power/Pac 1,** Auto F/X, 603/875-4400, $249. Macros for Photoshop are useful but restrictive. *Feb 97, p. 80*

★★★★/8.2 **PowerCADD 3.0,** Engineered Software, 910/299-4843, $795. Fast, pro-level drafting program gets some refinements. *Jan 97, p. 74*

★★★★/7.0 **Sculpt 3D 4.1,** Byte by Byte, 512/305-0360, $495. High-end 3-D for the mainstream. *Sep 96, p. 81*

★★★★/8.2 **Series 2, 3-D Filter 2.11,** Andromeda Software, 805/379-4105, $129. Photoshop filter projects images onto three-dimensional cubes, spheres, and cylinders. *Sep 96, p. 120*

★★★★★/9.2 **Series 3, Screens Filter 1.4,** Andromeda Software, 805/379-4109, $159. Converts a Photoshop image into alternative halftone patterns from mezzotints to wavy lines. *Sep 96, p. 120*

★★★★/8.1 **Slicer 1.0,** Fortner Research, 703/478-0181, $695. View 2-D slices of 3-D images. *Nov 96, p. 98*

★★★/6.5 **Stencil It 1.0,** Kaetron Software, 713/298-1500, $99. Low-cost program is good for charts, but not for art. *Jan 97, p. 72*

★★★★/8.2 **Stylist 1.0,** Alien Skin Software, 919/832-4124, $199. Plug-in adds graphic and text style sheets to Illustrator. *Oct 96, p. 64*

★★★/6.6 **Sucking Fish 1.01,** Naoto Arakawa, *gca00443@nittyserve.or.jp*, freeware. Offbeat, undocumented Photoshop gradient and pattern filters with encryption as an added bonus. *Sep 96, p. 120*

★★★/6.8 **Terrazzo 1.0,** Xaos Tools, 415/487-7000, $199. Photoshop filter repeats images to create seamless, organic pattern. *Sep 96, p. 120*

★★★★/7.9 **The Black Box 2.0,** Alien Skin Software, 919/832-4124, $119. Straightforward Photoshop filters for creating drop shadows, bevels, and glass refraction effects. *Sep 96, p. 120*

★★★★/7.4 **TurboCAD 2D/3D 3.0,** IMSI, 415/257-3000, $149. Nearly high-end CAD program with educational-software price. *Dec 96, p. 61*

★★★★/7.5 **TypeCaster 1.0,** Xaos Tools, 415/487-7000, $199. Adds three-dimensional text to any Photoshop image. *Sep 96, p. 120*

INTERNET/NETWORKING

★★★/6.5 **3-D Website Builder,** Virtus, 919/467-9700, $159. VRML authoring program is straightforward but limited. *Feb 97, p. 82*

★★★★/7.7 **Adobe PageMill 2.0,** Adobe Systems, 408/536-6000, $149. WYSIWYG approach to Web design is appealing and efficient. *Feb 97, p. 58*

★★★/5.7 **Amapi 2.11,** Yonowat, 415/788-1652, $398. 3-D modeler marred by awkward interface. *Nov 96, p. 87*

★★★★/7.2 **Apple Network Administrator's Toolkit,** Apple Computer, 408/996-1010, $599. Suite automates the most important chores of classroom management. *Dec 96, p. 70*

★★★★/7.0 **AppleScript 1.1,** Apple Computer, 408/996-1010, free. Standout CGI scripting tool is built into System 7.5. *Oct 96, p. 104*

★★/4.6 **Arachnid 1.6,** University of Iowa, *robert-mcburney@uiowa.edu*, free. This HTML editor helps you manage your site as a whole. *Oct 96, p. 114*

★★★/5.4 **BBEdit 4.0,** Bare Bones Software, 508/651-3561, $119. BBEdit is a useful tool for any active Webmaster. *Oct 96, p. 114*

★★★★/7.0 **BeyondPress 2.0,** Astrobyte, 303/534-6557, $595. XPress-to-HTML conversion program whisks you from XPress to the Internet. *Oct 96, p. 57*

★★★★/7.7 **Bookends Web 3.2,** Westing Software, 415/945-3870, $179. Useful, flexible tool for creating bibliographies on the Web. *Dec 96, p. 82*

★★★/5.5 **cc:Mail Mobile for Macintosh 2.0,** Lotus Development, 617/577-8500, $145. Speedy and straightforward choice for PC-centric environments, but lacks many features competitors offer. *Oct 96, p. 134*

★★★/6.6 **ChameleonNFS 3.6,** NetManage, 408/973-7171, $395 per user. Collection of small, fast Internet apps. *Nov 96, p. 81*

★★★★/8.6 **Claris Emailer 1.03,** Claris, 408/987-7000, $49 (estimated). The only application that dumps (almost) all of your messages in one in-box. *Oct 96, p. 134.* **Editors' Choice** for best e-mail over the Internet.

★★★/6.9 **Claris Home Page 1.0,** Claris, 408/727-8227, $99 (estimated). Home Page leads the pack of HTML editors. *Dec 96, p. 58*

★★★/6.8 **COPSTalk 2.0 for Windows 95,** CoOperative Printing Solutions, 770/840-0810, $159. Cross-platform networking for PC users who need access to Mac servers. *Nov 96, p. 68*

★★★/6.9 **Cyberdog 1.0,** Apple Computer, 408/996-1010, free. Internet tools are an interesting but incomplete showcase for OpenDoc technology. *Sep 96, p. 56*

★★★★/8.0 **CyberGauge,** Neon Software, 510/283-9771, $139. Network monitoring for the masses. *Nov 96, p. 83*

★★★/6.8 **DigiPhone 1.0,** Third Planet Publishing, 972/733-3005, $39.95. Make low-cost calls over the Internet. *Jan 97, p. 68*

★★★★/8.1 **Electronic Commerce Suite 2.0,** iCAT, 206/623-0977, $4995. Electronic Commerce Suite builds complex yet robust Web sites quickly and easily. *Oct 96, p. 104.* **Editors' Choice** for best software for building dynamic Web sites.

★★★★★/9.1 **EtherPeek 3.0,** The AG Group, 510/937-7900, $995. Slew of enhancements will make this network analyzer your right hand. *Dec 96, p. 77*

★★★/6.1 **Eudora Pro 3.0,** Qualcomm, 619/658-1200, $89. Internet e-mail reader improves, but not by much. *Nov 96, p. 77*

★★★★/7.8 **Excel Internet Assistant 1.0,** Microsoft, 206/882-8080, free. Excel Internet Assistant converts existing Excel files to HTML. *Oct 96, p. 114*

★★★★/8.1 **FirstClass 3.11,** SoftArc, 905/415-7000, $495 to $1495. Offers robust e-mail, conferencing, and other features, yet easy to use. *Oct 96, p. 134.* **Editors' Choice** for best company-wide e-mail.

★★★★/7.5 **Frontier 4.1,** UserLand Software, *http://www.scripting.com/frontier*, free. Fast and powerful scripting environment requires advanced programming knowledge. *Jan 97, p. 152.* **Editors' Choice** for best Internet tools.

★★★/5.3 **Front Office 1.5,** STF Technologies, 213/259-1710, $299. Being able to retrieve a call that's gone to voice mail is great, but easier setup is necessary. *Nov 96, p. 132*

★★★/6.7 **GlobalTransfer 1.0,** Global Village, 408/523-1000, $29.95. Transferring files the easy way. *Oct 96, p. 82*

★★★/6.1 **GNNPress 1.1,** PrimeHost, 800/879-6882, $199/month for commercial site. GNNPress combines a powerful HTML editor with a site-management tool. *Oct 96, p. 114*

★★/4.9 **golive Pro 1.1,** gonet communication, 415/463-1580, $99. Attractive HTML editor needs polishing. *Dec 96, p. 58*

★★★/5.6 **HexWeb XT 2.0,** HexMac International, 415/864-7592, $349. XPress-to-HTML conversion program whisks you from XPress to the Internet. *Oct 96, p. 57*

★★/4.2 **HoTMetaL Pro 3.0,** SoftQuad, 416/544-9000, $159. Dramatically improved Web editor is powerful but still quirky. *Feb 97, p. 58*

★★/3.8 **HTML Author 1.0,** Adobe Systems, 415/961-4400, included with PageMaker 6.0. This plug-in converts Adobe PageMaker files to HTML. *Oct 96, p. 114*

★★★★/7.9 **HTML Editor 1.1.4,** Rick Giles, *rick.giles@acadiau.ca*, $25. This text editor is a great all-around HTML coding aid. *Oct 96, p. 114.* **Editors' Choice** for best Web authoring tools.

★★★/6.8 **HVS Color 1.2,** Digital Frontiers, 847/328-0880, $99. Keep Web graphics small, colors true. *Oct 96, p. 72*

★★★★/7.7 **InterMapper 1.0.1,** Dartmouth College, 603/646-2643, $795. World-class network management. *Jan 97, p. 83*

★★★★/7.3 **Internet Phone 3.0.1,** VocalTec, 201/768-9400, $49.95. Novices may like this software that lets you make low-cost calls over the Internet. *Jan 97, p. 68*

★★★/6.5 **LAN Commander,** Power On Software, 612/879-9190, $299.95 five-station pack. Network management made simple. *Oct 96, p. 79*

★★★/6.2 **MacHTPL 2.2.2,** Tim Endres, *time@ice.com*, free. This preprocessor can help you tailor your HTML for specific browsers *Oct 96, p. 104*

★★★/6.3 **MacPerl 5.0.6,** Matthias Neeracher, *neeri@iis.ee.ethz.ch*, free. This CGI scripting language is portable to other platforms. *Oct 96, p. 104*

★★★/6.8 **MacSOUP 2.1,** Stefan Kurth, *stk@kagi.com*, $20. Strong offline e-mail and news reader; that's all it handles, though. *Jan 97, p. 152*

★★★/6.7 **Marionet 1.1.1,** Allegiant Technologies, 619/587-0500, $149. Flexible scripting and search tool for authoring environments, but it requires significant programming knowledge. *Jan 97, p. 152*

★★★★/7.0 **MegaPhone 1.02,** Cypress Research, 408/486-7900, $100. Great for automated dialing, but limited phone-book capability is disappointing *Nov 96, p. 132*

★★★★/7.0 **NetCloak 2.1,** Maxum Development, 630/830-1113, $195. Quirky WebStar add-on is a must-buy. *Jan 97, p. 66*

★★★★/8.7 **NetDoubler 1.0,** Asanté, 408/435-8388, $69.95 to $99. Boosts network speeds for large files. *Dec 96, p. 68*

★★★/6.5 **NetForms 2.0,** Maxum Development, 630/830-1113, $195. WebStar add-on fills gaps in server software. *Jan 97, p. 66*

★★★★/7.4 **Netscape Navigator 3.0,** Netscape Communications, 415/937-2555, $49. Still the best browser, but could use a diet. *Nov 96, p. 62*

★★★★/7.1 **NewsHopper 1.2,** SW15 Software, *http://www.demon.co.uk/sw15/*, $59. Powerful, scriptable reader, but can't be scheduled and handles only Usenet news. *Jan 97, p. 152*

★★★/6.6 **Now Up-to-Date Web Publisher 1.0,** Now Software, 503/274-2800, $129.95. Publish your calendars and contact lists on the Web. *Dec 96, p. 78*

★★★/6.7 **PageMill 1.02,** Adobe Systems, 415/961-4400, $149. This WYSIWYG HTML editor does its job with reliability and flair. *Oct 96, p. 114*

★★★★/7.5 **PC MacLAN 6.0 for Windows 95,** Miramar Systems, 805/966-2432, $199. The choice for peer-to-peer cross-platform networking. *Nov 96, p. 68*

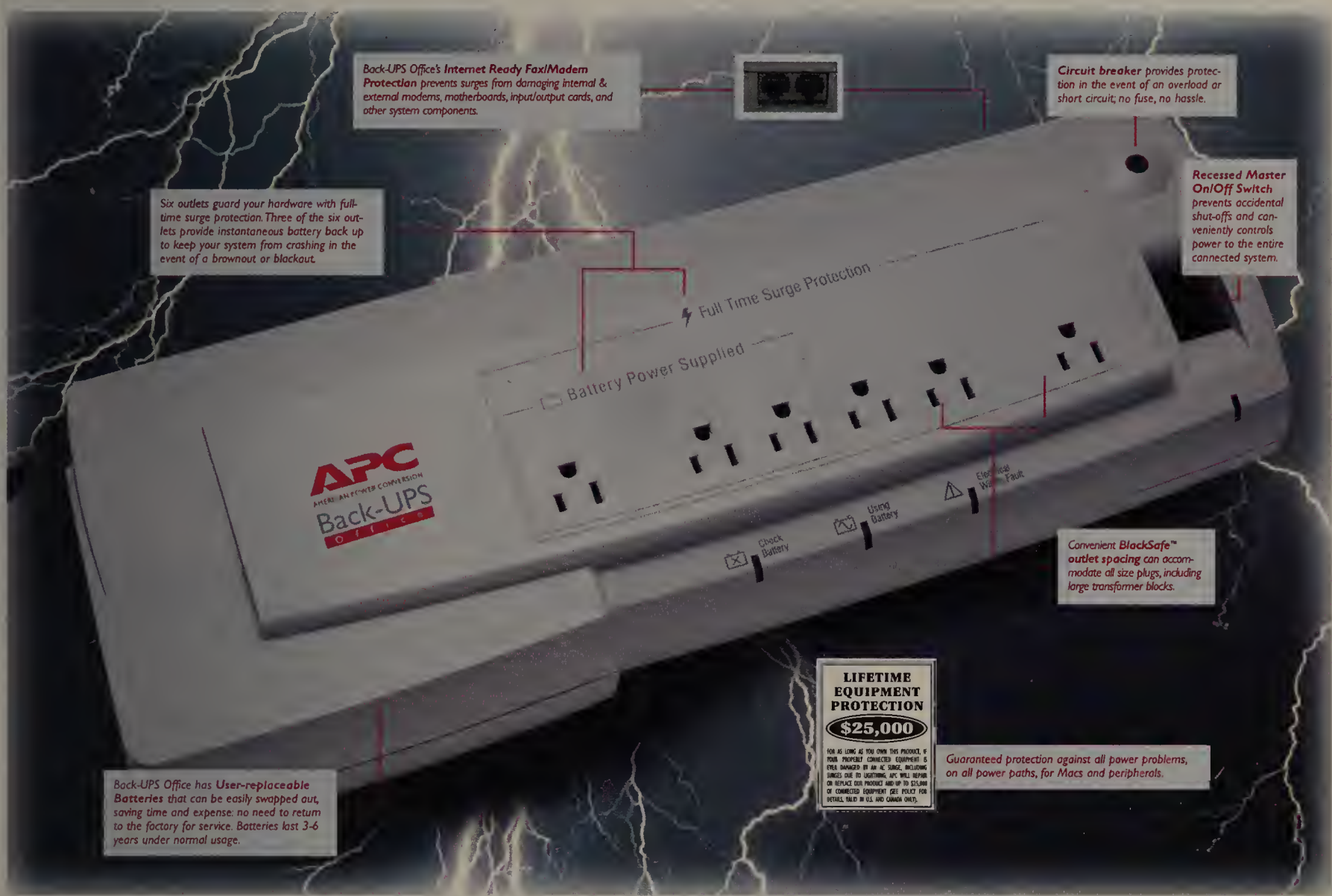
★★★/6.9 **Phantom 1.1,** Maxum Development, 708/830-1262, $395. Wonderful Web robot for the Mac is server-friendly, but also expensive and useful primarily for Webmasters. *Jan 97, p. 152*

★★★/6.3 **QuickMail 3.6,** CE Software, 515/221-1801, $199 to $1449. Easy to use, but message-tracking features are limited. *Oct 96, p. 134*

★★★★/7.6 **Retrieve It 2.5,** MVP Solutions, 415/562-

continues

"They thought my new Multipath Back-UPS® Office™ was just a big surge suppressor – then the lights went out."



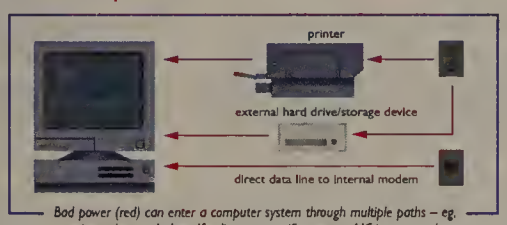
At last, a safe place to plug everything: Multipath Back-UPS Office for Mac workstations and peripherals

Protect ME! APC

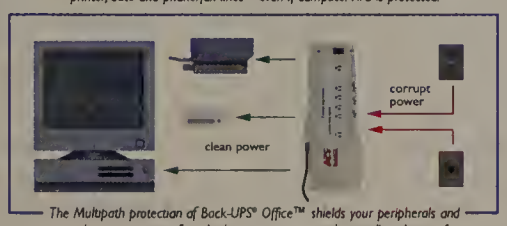
Facing the darkness is hard, but inevitable: You have a better chance of winning the lottery than of escaping power problems: They're the single largest cause of computer data loss and hardware damage.

Back-UPS Office provides reliable power for your entire system. Instantaneous battery backup ensures uninterrupted operation of your CPU, monitor and an external storage device. Full-time surge suppression and site-wiring fault protection spreads a true Multipath safety net under any remaining integrated peripherals, like modems, printers, faxes and phone systems. Back-UPS Office also provides convenient BlockSafe™ outlet spacing to handle all size plugs – even large block transformers.

Multipath Means Total Power Protection



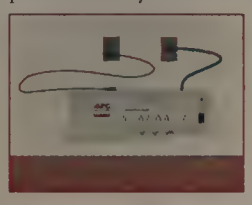
Bad power (red) can enter a computer system through multiple paths – eg. printer, data and phone/fax lines – even if computer A/C is protected.



The Multipath protection of Back-UPS® Office™ shields your peripherals and guards your computer from bad power on every path, providing clean, safe power (green), to your entire system.

Unique Multipath protection keeps your Mac and data safe

Plugging a phone line into your computer doubles your vulnerability to power problems; add any peripheral, and it triples. Even if your AC power-line is shielded, when a surge hits an unprotected peripheral, it can blaze down serial and data lines, and toast your expensive Mac.



Back-UPS Office's compact design installs easily on desktop, floor or mounts to wall.

Multiple peripherals and data lines to and from your system are vital, but dangerous. Without them, you can't do your job. However, if a power sag makes your modem drop the line while you're downloading from the Internet, or locks your keyboard before you've saved work, you lose time, money and spend another late night at the office to meet your deadline.

Back-UPS Office protects your entire system

Until now, protection for your entire system required several devices. But multi-device protection can leave you vulnerable to line noise and unwanted data glitches created by the voltage differential between outlets. Those glitches are prevented with the Back-UPS Office common voltage reference.

Back-UPS Office means true Multipath protection, clean, safe power to every peripheral, and instant battery backup to keep your cutting edge system and O/S from crashing. It means protection for less by integrating the security of a surge suppressor with the power of a UPS, guaranteed up to $25,000.

RECOMMENDED TEST CENTER 1996 Reseller News SPRING COMDEX

"Back-UPS Office [is] a shoo-in for the small-office/home-office computing market and for general desktop workstations"
-Computer Reseller News

APC has won more awards for reliability than all other brands combined

The Multipath Power Protection Advantage	Traditional Surge Protector	Traditional UPS	Back-UPS Office
Protected Paths			
AC	•	•	•
Data			•
Phone			•
Total Outlets	7	2	6
Number of Block Outlets			2
Protection from			
Surges	•	•	•
Spikes	•	•	•
Blackouts		•	•
Brownouts		•	•
Overvoltages			•
Typical Runtime in Minutes			
with Pentium 100 w/15" monitor		10	10
Battery backup for			
PC		•	•
Monitor		•	•
Storage Devices/Zip Drives			•
Full-time surge protection for			
Fax/Modem	•		•
Laser Printer	•		•
Speakers	•		•
Dataline protection for			
Internet or Network			•

Traditionally, protecting all your equipment meant buying a surge suppressor and a UPS. Even then, only your AC line was protected. New Back-UPS Office protects all paths to your equipment. Bulletproof Multipath protection

Protect yourself before you kick yourself. Get your new Back-UPS Office today (list price: $179.99), or call APC for a FREE 60-page catalog!

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Circle 72 on reader service card

Star Ratings

3457, $65. Speedy, complex searches of your computer and the Web. *Dec 96, p. 80*

★★★/6.3 **SiteMill 1.0.3**, Adobe Systems, 415/961-4400, $595. SiteMill is a powerful management tool for your Web site. *Oct 96, p. 114*

★★/4.8 **SuperVoice 2.0**, Pacific Image Communications, 818/457-8880, $130. Hampered by bugs, glitches, and inability to import phone numbers. *Nov 96, p. 132*

★★★/6.7 **SupraSonic VoiceMail**, Diamond Multimedia, 360/604-1400, $289. Still looks like fax software with voice capability added on, but it's got potential. *Nov 96, p. 132*

★★★/6.6 **Tango 1.5**, EveryWare Development, 905/819-1173, $495. This CGI program forwards queries to a SQL database and reformats the responses into HTML. *Oct 96, p. 104*

★★★★/7.3 **Tango for FileMaker Pro 3.0**, EveryWare, 905/819-1173, $349. Tool kit for putting your FileMaker database on the Web. *Oct 96, p. 59*

★★★/6.7 **Tapestry 1.1**, Concept 1, 905/305-8655, $69. Beginners get help weaving the perfect Web site. *Oct 96, p. 80*

★★★/6.8 **tcpConnect4 4.0 Enterprise**, InterCon, 703/709-5500, $495 per user. Internet access suite is easy to set up, but lacks some conveniences. *Nov 96, p. 81*

★★★/6.9 **TCP/IP Scripting Addition**, Mango Tree Software, 617/327-8663, $49. Tool for AppleScript provides access to TCP/IP commands. *Jan 97, p. 152*

★★★★/7.2 **Timbuktu Pro 3.0**, Farallon Communications, 510/814-5000, $139. Network access tool extends its reach. *Jan 97, p. 69*

★★★/5.5 **Timbuktu Pro for Networks 2.0**, Farallon Communications, 510/814-5000, $139 to $3999. Despite some drawbacks, this is the next-best thing to being there. *Oct 96, p. 134*

★★★★/7.4 **Tumbleweed Publishing Essentials 1.0**, Tumbleweed Software, 415/363-7022, $695. A faster, cheaper alternative to Acrobat. *Oct 96, p. 70*

★★★/5.5 **Voice Messenger**, Cypress Research, 408/486-7900, $149. A clean and simple interface, but easier setup is necessary. *Nov 96, p. 132*

★★★/5.8 **WebArranger 2.0**, CE Software, 515/221-1801, $79. Powerful bookmark manager is good at managing large quantities of information. *Jan 97, p. 152*

★/2.6 **Web Buddy 1.0**, DataViz, 203/268-0030, $50. Offline Web browser makes it easy to set up a schedule, but is a memory hog. *Jan 97, p. 152*

★/1.0 **WebDoor 1.2**, Open Door Networks, 541/488-4127, $20 to 60/month. WebDoor's authoring software is abysmal. *Oct 96, p. 114*

★★★★/7.9 **Webmaker 2.2**, Harlequin, 617/374-2400, $99. For converting FrameMaker documents to the Web, WebMaker has no equal. *Oct 96, p. 114.* **Editors' Choice** for best Web authoring tools.

★★★★/7.2 **Web-Motion 1.0**, Terran Interactive, 408/278-9025, $99.95. Web-savvy plug-in for first-rate compression utility. *Jan 97, p. 81*

★★/4.4 **WebWhacker 1.0.8**, Forefront Group, 713/961-1101, $70. Clean, simple interface, but offline Web browser lacks scripting and scheduling. *Jan 97, p. 152*

★★★★/7.8 **Word Internet Assistant 1.0**, Microsoft, 206/882-8080, free. Word Internet Assistant converts existing Word files to HTML. *Oct 96, p. 114*

★★★★/8.0 **YoYo 1.2**, Big Island Communications, 408/342-8300, $149. Innovative telephony software is an amazing productivity tool. *Nov 96, p. 64*

MEDIA

★★★★/7.1 **3D Web Workshop 1.0**, Specular International, 413/253-3100, $249. Instant Internet presence in 3-D. *Oct 96, p. 68*

★★★★/8.2 **AD-1 Pro Audio Analyzer 2.0**, Intelligent Devices, 410/744-3044, $349 to $449. Audio meters for the discriminating producer. *Dec 96, p. 84*

★★★★ **Adobe PageMaker 6.0**, Adobe Systems, 206/622-5500, $895. Page-layout program's upgrade includes practical and powerful improvements. *Nov 95, p. 60*

★★★★/7.4 **Adobe Premiere 4.2**, Adobe Systems, 415/961-4400, $795. Video editor offers significant enhancements, including CD-ROM Movie Maker plug-in. *Mar 96, p. 90*

★★★★/7.5 **Boris Effects 2.0**, Artel Software, 617/566-0870, $350 to $695. Inexpensive, multichannel digital-video-effects program is a worthwhile investment. *Jan 97, p. 76*

★★★/6.8 **ClickWorks 1.0.2**, Pitango, 617/280-7163, $985. Presentation program is a solid choice. *Feb 97, p. 74*

★★★/6.7 **Digital Chisel://HTML 2.1.3**, Pierian Spring Software, 503/222-2044, $109 to $995. Multimedia authoring doesn't make it on the Web. *Jan 97, p. 78*

★★★★/7.5 **Digital Performer 1.71**, Mark of the Unicorn, 617/576-2760, $895. Audio program does an unparalleled job of altering pitch and tempo. *Sep 96, p. 76*

★★★★ **FrameMaker 5.0**, Adobe Systems, 408/975-6000, $895. Page-layout program is a good choice for technical-document creation. *Nov 95, p. 63*

★★★/6.0 **MasterJuggler Pro 2.0**, Alsoft, 713/353-4090, $89.95. MasterJuggler wants to be your favorite font manager. *Sep 96, p. 72*

★★★★/7.4 **Movie Cleaner Pro 1.2.1**, Terran Interactive, 408/278-9025, $189.95. First-rate movie compression utility is a must-have. *Jan 97, p. 81*

★★★★/7.2 **MovieFlo' 2.0.2**, The Valis Group, 415/435-5404, $699. Image-distortion software for pros. *Jan 97, p. 92*

★★★/5.5 **MovieStar 1.5**, Intelligence at Large, 215/387-6002, $149.95. Easy QuickTime moviemaking and animation for the Internet. *Feb 97, p. 92*

★★★★/7.3 **mTropolis 1.1**, mFactory, 415/548-0600, $1195. Sophisticated authoring environment is a terrific tool for game developers. *Feb 97, p. 74*

★★★★/7.8 **Pro View 1.3**, E-magine, 800/603-1474, $99.95. Back-to-basics presentation tool. *Nov 96, p. 95*

★★★★/8.0 **QuarkImmedia 1.0**, Quark, 303/894-8888, $995. An easy move from print to multimedia. *Dec 96, p. 57*

★★★/6.1 **Ready,Set,Go 7.0.2**, Abbott Systems, 914/747-3116, $395. Revamped page-layout software offers more than the basics. *Sep 96, p. 83*

★★★★/7.2 **Studio Vision Pro 3.0.3**, Opcode Systems, 415/856-3333, $895. For MIDI-audio conversion, this audio program is the one to buy. *Sep 96, p. 76*

★★★/6.1 **Suitcase 3.0.1**, Symantec, 503/334-6054, $69.95. Suitcase vies with MasterJuggler for superiority, and still no clear winner. *Sep 96, p. 72*

UTILITIES

★★★/6.7 **After Dark 4.0**, Berkeley Systems, 510/540-5535, $30 to $40. Glitzier, but not necessarily better, than previous versions. *Feb 97, p. 76*

★★/4.1 **At Ease 3.0**, Claris, 408/987-7000, $49. Can be easily defeated with a Disk Tools floppy or separate start-up disk. *Nov 96, p. 146*

★★★★/7.9 **BorderGuard Access Router**, Network Systems, 612/424-4888, $1700. Transparent encryption of AppleTalk and TCP/IP that lets you use the Internet instead of a private WAN. *Nov 96, p. 146*

★★★★/7.6 **CanOpener 3.5**, Abbott Systems, 914/747-4171, $65. Reliably recovers text and graphics from damaged files. *Feb 97, p. 88*

★★★/6.2 **cypherPad**, usrEZ Software, 714/756-5140, $49. Easy setup and usage; good basic security. *Nov 96, p. 146*

★★★★/7.3 **DiskGuard 1.5**, ASD Software, 909/624-2594, $79. Good combination of low price and easy installation. Solid, basic protection. *Nov 96, p. 146*

★★★★/7.9 **DiskLock 4.0**, Symantec, 541/984-2490, $129. Easy automatic setup makes this a snap to configure; has most protection features you need. *Nov 96, p. 146*

★★/4.9 **DiskWorks 3.0.2**, MicroNet Technology, 714/453-6100, $299. Disappointing hard-drive formatter has an awkward interface. *Dec 96, p. 62*

★★★/6.1 **Dr. Solomon's Anti-Virus Toolkit 7.61**, S&S International, 617/273-7400, $85. Antivirus utility can check DOS disks. *Dec 96, p. 60*

★★★/6.0 **Empower 5.0.4**, Magna, 408/879-7907, $129. Decent design, but overpriced for features offered. *Nov 96, p. 146*

★/1.8 **Executor 2.0**, Abacus Research & Development, 505/766-9115, $249. Mac emulator for PCs falls far, far short. *Feb 97, p. 78*

★★/3.9 **Faxstf 3.2**, STF Technologies, 816/463-1412, $99 to $295. Faxing application suffers from its revision. *Oct 96, p. 66*

★★★★/8.0 **FileGuard 3.0**, ASD Software, 909/624-2594, $139. Most of the features you need, combined with ease of installation, reliable performance, and robust protection. *Nov 96, p. 146.* **Editors' Choice** for best desktop security software.

★★★/6.6 **Font Box 1.8.3**, Insider Software, 619/622-9900, $79.95 to $169.95. Font fixer could use some repairs. *Nov 96, p. 90*

★★/4.9 **FoolProof 2.5**, SmartStuff Software, 503/231-4300, $39. Decent design, but lacks features and is too easy to defeat. *Nov 96, p. 146*

★★★★/7.0 **Hard Disk ToolKit 2.0.1**, FWB, 415/463-3500, $199. Reliable hard-drive formatter can actually tweak a drive to run faster. *Dec 96, p. 62*

★★★★/8.2 **Here & Now 2.0**, Software Architects, 206/497-0122, $75. The best choice for helping Windows 95 files work with the Macintosh. *Sep 96, p. 60*

★★★★/8.5 **HSM ToolKit 1.0**, FWB, 415/325-4392, $79. Infinite storage made infinitely more simple. *Oct 96, p. 77*

★★★/6.8 **KeyQuencer 2.0**, Binary Software, 310/449-1481, $39.95 direct. Macro program for speed addicts and control freaks. *Dec 96, p. 59*

★★★★/7.8 **KeyServer 4.1**, Sassafras Software, 603/643-3351, $800. Easy-to-install tool enforces usage thresholds and lets you track applications. *Nov 96, p. 146*

★★★/5.6 **LaserMerge Electronic Paper 2.0**, MindGate Technologies, 615/937-6800, $95. Souped-up printing utility multiplies your output options. *Sep 96, p. 87*

★★★/5.9 **Mac Drive 95 1.0**, Media4, 515/225-7409, $60. Mac Drive 95 offers acceptable, if inelegant, file sharing with Windows 95. *Sep 96, p. 60*

★★★★/8.3 **Mac Manager 3.1**, ELS, 352/375-0558, $299. Provides both safe and impenetrable access protection and data encryption. *Nov 96, p. 146*

★★★/6.7 **MacOpener 2.0**, DataViz, 203/268-0030, $50. A marked improvement over the flawed original, but its reliance on DOS extensions is disappointing. *Sep 96, p. 60*

★★★/6.8 **MacTransfer 1.0**, Insignia Solutions, 408/327-6000, $55. For inexpensive simplicity with some

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limitations, MacTransfer is a solid choice for cross-platform file exchanges. *Sep 96, p. 60*

★★★★/7.5 **MATLAB Statistics Toolbox 2.0**, The MathWorks, 508/647-7000, $395. Statistical analysis tool on steroids. *Dec 96, p. 75*

★★★★★/9.3 **MATLAB Wavelet Toolbox 1.0**, The MathWorks, 508/647-7000, $895. Powerful wavelet-analysis tool. *Dec 96, p. 75*

★★★★/7.7 **McAfee VirusScan 2.0**, McAfee Associates, 408/988-3832, $65. World-class virus protection has little impact on Mac's performance. *Dec 96, p. 60*

★★★★/8.1 **NetShade 1.1**, Atemi, 217/352-3689, $299. Easy to install and configure, it scrambles data and foils all but the most determined sniffers. *Nov 96, p. 146*

★★★★/8.1 **Network Security Guard 3.1**, Mr. Mac Software, 619/453-2845, $289. Scans your network for unintentional guest access, poorly chosen passwords, and other security loopholes. *Nov 96, p. 146*

★★★★/7.1 **On Guard 2.1**, Power On Software, 216/735-3116, $70. Easy install, attractive Finder-like configuration menu; low-priced. *Nov 96, p. 146*

★★★★/8.2 **QuicKeys 3.5**, CE Software, 515/224-1995, $119. QuicKeys exists to make macros easier. *Dec 96, p. 59*

★★★★/8.6 **RAM Doubler 2.0**, Connectix, 415/571-5100, $99. Control panel now triples your RAM. *Dec 96, p. 67*

★★★/6.4 **SAM 4.5**, Symantec, 408/253-9600, $69.95. Industrial-strength virus protection. *Feb 97, p. 86*

★★★/6.1 **SecretAgent 3.0**, AT&T, 847/405-0390, $249. An overpriced one-trick pony; its advantage is cross-platform compatibility. *Nov 96, p. 146*

★★★★/7.8 **Spell Catcher 1.5.6**, Casady & Greene, 408/484-9228, $59.95. Resurrected Thunder 7 is still much more than a spelling checker. *Dec 96, p. 73*

★/2.7 **StellarFax 1.1**, TechPool, 216/291-1922, $249. Sends inferior-quality faxes faster. *Feb 97, p. 90*

★★★★/7.3 **Stuffit Deluxe 4.0**, Aladdin Systems, 408/761-6200, $129.95. Same compression format, but faster and with a brilliant Finder twist. *Oct 96, p. 61*

★★★/5.1 **TransferPro 1.0**, Digital Instrumentation Technology, 505/662-1459, $189. File-transfer capabilities needs to work better in the Windows 95 world. *Sep 96, p. 60*

★★★★/7.0 **ultraSecure**, usrEZ Software, 714/756-5140, $239. A textbook of required security features, hampered by so-so manual and complex installation. *Nov 96, p. 146*

★★★/6.4 **ultraShield**, usrEZ Software, 714/756-5140, $149. Mixed combination of terrific features with complex installation and multiple warnings about use with other software. *Nov 96, p. 146*

★★/4.3 **UnderCover**, SmartStuff Software, 503/231-4300, $39. A slightly buggy one-trick pony. *Nov 96, p. 146*

★/2.1 **ViaCrypt PGP 4.0**, ViaCrypt, 602/944-0773, $129. Hard to install, hard to use; few saving graces. *Nov 96, p. 146*

★★★/6.9 **Virex 5.6.7**, Datawatch, 508/988-7000, $100. Fast scanning, but caused general system slowdown. *Nov 96, p. 146*

★★★★/7.0 **WebLock 1.0**, Maxum Development, 708/830-1113, $195. Gives your Web server access protection via password log-in to protect private pages. *Nov 96, p. 146*

★★★★/8.5 **WebStar SSL 1.2.4**, Quarterdeck, 310/309-3700, $1295. Lets you use transparent encryption to exchange sensitive data safely with security socket layer-capable Web browsers. *Nov 96, p. 146.* Editors' Choice for best network security.

★★★/6.5 **Working Papers**, Dominion Software, 617/332-1144, $199.95. Manage your documents with OCR program and document organizer. *Feb 97, p. 94*

★★/3.7 **XChange 1.2**, Optima Technologies, 714/476-0515, $49. Cross-platform transfer capabilities are a buggy, premature disappointment. *Sep 96, p. 60*

Hardware

MISCELLANEOUS HARDWARE

★★★★/8.9 **3M Precise Mousing Surface**, 3M, 612/733-1110, $15. Throw out your neoprene pad and treat your mouse to a deluxe surface. *Jan 97, p. 56*

★★★★/7.5 **Agfa StudioStar**, Agfa, 508/658-5600, $989. Graphics pros will treasure scanner's high-quality scans and powerful software. *Feb 97, p. 62*

★★★★/8.2 **AirCommunicator Lite**, Air Communications, 408/567-8000, $695. Cellular fax modem with flair offers a complete solution. *Nov 96, p. 79*

★★★/6.4 **Alps Adjustable Mouse**, Alps Electric, 408/432-6000, $39.95. Mouse's movable shell tilts for optimum angle. *Sep 96, p. 98*

★★/4.8 **Apple Color OneScanner 1200/30**, Apple Computer, 408/996-1010, $799. A big disappointment; offers little advantage over its lower-priced predecessor. *Feb 97, p. 62*

★★★/6.5 **Color QuickCam 1.0**, Connectix, 415/571-5100, $299. Low-cost camera for passable digital video. *Sep 96, p. 79*

★★★★/8.4 **Epson Expression 636**, Epson America, 800/922-8911, $899 as tested. Low-cost color scanner gets the nod for all-around use. *Feb 97, p. 62*

★★/4.6 **Fujix DS-220**, Fuji, 914/789-8100, $1200. Digital camera misses the mark. *Sep 96, p. 85*

★★★★/8.8 **MicroWorks**, Cambridge SoundWorks, 617/332-5936, $349. In terms of price for performance, speaker system is in a class by itself. *Dec 96, p. 66*

★★/3.1 **Midi Land S35/818 Systems**, Midi Land, 909/592-1168, 818 desktop speaker $79.95, S35 subwoofer $239.95. Speaker system has mediocre sound quality. *Nov 96, p. 72*

★★★/6.0 **NovaModem 288 1.0**, NovaLink Technologies, 510/249-9777, $229. Decent performance from PowerBook PC Card modem. *Nov 96, p. 94*

★★★★/7.6 **SoundWorks**, Cambridge SoundWorks, 617/332-5936, $219.95. High-quality audio product at an affordable price. *Dec 96, p. 66*

★★★/5.5 **Stingray 4.0**, CoStar, 203/661-9700, $55. Trackball offers flexible design but limited programmability. *Feb 97, p. 70*

★★★★/7.0 **Supra Simple Internet 33.6 1.0**, Diamond Multimedia, 360/604-1400, $159.95. Modem makes Internet access quick and easy. *Jan 97, p. 90*

★★★/5.2 **TrackMan Marble**, Logitech, 510/795-8500, $99. Restrictive design and unimpressive software. *Feb 97, p. 70*

★★★★/8.5 **Turbo Mouse 5.0**, Kensington, 415/572-2700, $110. MouseWorks software makes programmable trackball a standout. *Feb 97, p. 70*

★★★/6.9 **Viewpoint Model 100**, Lightware, 503/641-7873, $5795. Much light, some sound in a surprisingly small projector. *Nov 96, p. 85*

★★★★/7.1 **Yamaha System 45**, Yamaha, 714/522-9240, $249.95. Speakers give you decent sound at a decent price. *Nov 96, p. 72*

PRINTERS

★★★/5.7 **4039 10plus**, Lexmark, 606/232-2000, $1249. Fast on text, but slow Postscript emulation; high-quality output; expensive. *Sep 96, p. 181*

★★★/6.9 **Apple Color StyleWriter 1500**, Apple Computer, 408/996-1010, $249. Lackluster performance and image quality mark this color ink-jet. *Feb 97, p. 140*

★★★★/7.5 **Apple Color StyleWriter 2500**, Apple Computer, 408/996-1010, $349. Relatively fast color ink-jet has fair image quality. *Feb 97, p. 140*

★★★★/7.3 **BJC-4550**, Canon Computer Systems, 714/438-3000, $499. Ink-jet produces beautiful images with optional photo ink kit. *Feb 97, p. 140*

★★★/6.5 **Canon CLBP 360PS**, Canon USA, 516/328-5000, $12,500. Color laser printer had good text output, but other tests were mediocre. *Nov 96, p. 157*

★★★/6.7 **Color LaserWriter 12/600 PS**, Apple Computer, 408/996-1010, $6989 (estimated). Slow speed but excellent text output. *Nov 96, p. 157*

★★★★/7.8 **DeskJet 870Cse**, Hewlett-Packard, 408/246-4300, $499. Outstanding color ink-jet for inexpensive office printing. *Feb 97, p. 140*

★★★/6.9 **DeskJet 1600CM**, Hewlett-Packard, 408/246-4300, $1999. Expensive ink-jet printer offers good speed and crisp text. *Feb 97, p. 140*

★★★/5.9 **DeskWriter 600**, Hewlett-Packard, 408/246-4300, $199. Decent speed and average print quality at a nice price. *Feb 97, p. 140*

★★★★/7.2 **DeskWriter 680c**, Hewlett-Packard, 408/246-4300, $279. Color ink-jet offers above-average image quality. *Feb 97, p. 140*

★★★★/7.2 **Digital Science 8650 PS**, Eastman Kodak, 800/235-6325, $10,795 plus $995 for Ethernet. Top performance and solid image quality highlight Kodak's newest dye-sub printer. *Oct 96, p. 60*

★★★/5.1 **HP Color LaserJet 5M**, Hewlett-Packard, 408/246-4300, $9195. Inferior output; slow; messy consumables. *Nov 96, p. 157*

★★★★/7.1 **HP LaserJet 5MP**, Hewlett-Packard, 408/246-4300, $1299. Consistently quick performance and high-quality output. *Sep 96, p. 181.* Editors' Choice for best personal laser printers..

★★★/5.6 **LaserWriter 4/600 PS**, Apple Computer, 408/996-1010, $929 (estimated). Slow overall performance, good text and adequate-quality graphics output. *Sep 96, p. 181*

★★★/5.8 **LaserWriter 12/640 PS**, Apple Computer, 408/996-1010, $1599 to $1829. Workgroup printer is slower—but cheaper—than HP's LaserJet 5M. *Oct 96, p. 62*

★★★/6.6 **magicolor CX/32**, QMS, 334/633-4300, $7999. Unexceptional output for this color laser printer. *Nov 96, p. 157*

★★★/5.4 **MD-2010**, Alps Electric, 408/432-6000, $499. Low-end color printer is slow, with poor-quality output. *Feb 97, p. 140*

★★★/6.5 **microLaser Pro/8**, Texas Instruments, 800/848-3927, $1299. Speedy performance, but poor-quality graphics output. *Sep 96, p. 181*

★★/4.9 **OL610e/PS**, Okidata, 609/235-2600, $949. Middling performance; poor text and graphics output quality. *Sep 96, p. 181*

★★★/6.1 **OL810e/PS**, Okidata, 609/235-2600, $1439. Quick performance; 1200 by 600 dpi resolution; excellent text but poor graphics output. *Sep 96, p. 181*

★★★★/7.0 **Optra C**, Lexmark International, 606/232-2000, $6849. This color laser printer has easy-to-use controls; good text and graphics output. *Nov 96, p. 157*

★★/4.3 **Personal LaserWriter 300**, Apple Computer, 408/996-1010, $652 (estimated). Slow performance, grainy output, low price. *Sep 96, p. 181*

★★★★/7.9 **Phaser 350**, Tektronix, 503/682-7377, $3495. Solid-ink printer delivers laser-quality output. *Nov 96, p. 67*

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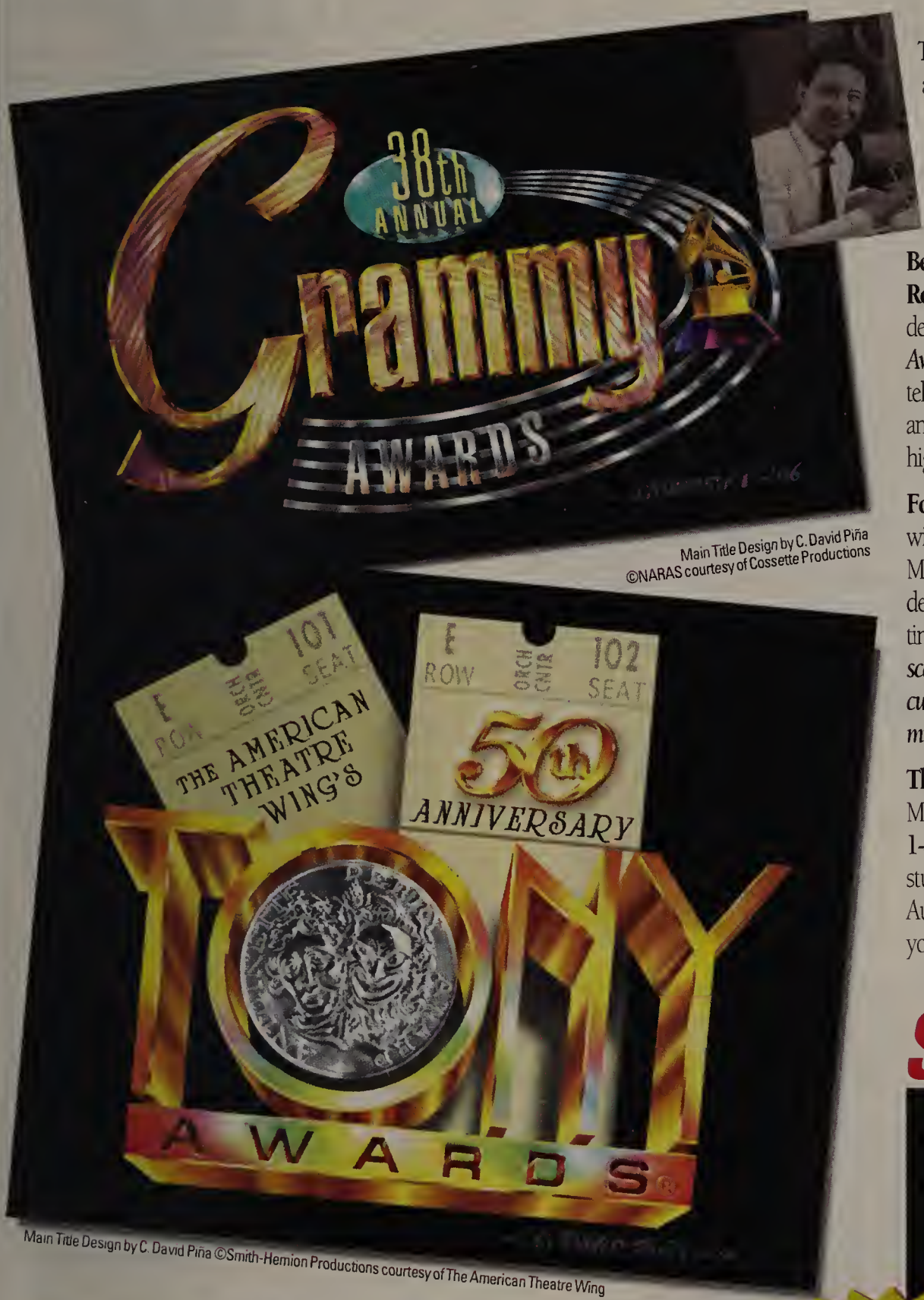

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Star Ratings

★★★★/7.6 **Phaser 550**, Tektronix, 503/685-3067, $6995. Fastest color laser printer tested; superior output; true 1200-dpi resolution. *Nov 96, p. 157.* **Editors' Choice** for best color laser printers.

★★★★/7.8 **Stylus Color 500**, Epson America, 310/782-0770, $279. Good price, output, and speed, but this color ink-jet is messy. *Feb 97, p. 140*

★★★★/7.2 **XPrint 4915 Plus**, Xerox, 716/442-4028, $4995. Top-notch graphic output; a great color laser printer value. *Nov 96, p. 157.* **Editors' Choice** for best color laser printers.

★★★/6.9 **XPrint 4925 Plus**, Xerox, 716/442-4028, $8995. Color laser printer's graphics results are among the best, but speed was unimpressive. *Nov 96, p. 157*

VIDEO/DISPLAY

★★★/6.3 **Diamond Pro 91TXM**, Mitsubishi Electronics America, 714/220-2500, $1699. Pricey for an average product, with below-average image quality. *Jan 97, p. 125*

★★★/6.1 **G200**, IBM, 914/766-1900, $1469. Easy to use, but the image quality is below average. *Jan 97, p. 125*

★★★★/7.6 **G810**, ViewSonic, 909/869-7976, $1595. A great price for a top pick in both usability and image quality. *Jan 97, p. 125.* **Editors' Choice** for best two-page monitors.

★★★/6.7 **Multigraph 445Xi**, Nokia Display Products, 415/331-4244, $1899. A little pricey for a monitor that offers only medium image quality. *Jan 97, p. 125*

★★★/6.7 **Multiple Scan 20**, Apple Computer, 408/996-1010, $2149. Good overall image quality, but pricey for its category. *Jan 97, p. 125*

★★★/6.6 **MX21F-M**, Mag InnoVision, 714/751-2008, $1699. Average price for average usability and image-quality scores. *Jan 97, p. 125*

★★/4.7 **P201**, IBM, 914/766-1900, $2635. Poor image quality and hard to use. *Jan 97, p. 125*

★★★/6.2 **PanaSync S21**, Panasonic, 201/348-7000, $1899. Good controls, but a little expensive for below-average image quality. *Jan 97, p. 125*

★★★/5.8 **PrecisionView 21**, Radius, 408/541-6100, $2749. Overpriced for only average test scores and a one-year warranty. *Jan 97, p. 125*

★★★/6.9 **Pro P810**, ViewSonic, 909/869-7976, $1745. Superb image quality, but costlier than its sibling, the G810. *Jan 97, p. 125*

★★★★/7.4 **RasterOps SuperScan Mc20**, Hitachi NSA, 617/461-8300, $1599. Good bargain for an overall good performer. *Jan 97, p. 125*

★★★/6.6 **RasterOps SuperScan Mc801HR**, Hitachi NSA, 617/461-8300, $2199. A bit costly for only above-average image quality, mediocre controls. *Jan 97, p. 125*

★★★/6.4 **SyncMaster 21 GLs**, Samsung Electronic America, 201/971-0400, $1959. Expensive unit for overall average performance. *Jan 97, p. 125*

★★★/5.6 **Ultra 20-M**, Princeton Graphic Systems, 714/751-8405, $1249. Inexpensive, but you get what you pay for—not high quality. *Jan 97, p. 125*

★★★/6.4 **VisionMaster 21**, Iiyama North America, 215/957-6543, $1945. Overall a good unit, but not good enough to justify the price. *Jan 97, p. 125*

★★★★/8.3 **VisionMaster Pro 21**, Iiyama North America, 215/957-6543, $1995. Top overall image quality with clear on-screen controls. *Jan 97, p. 125.* **Editors' Choice** for best two-page monitors. m

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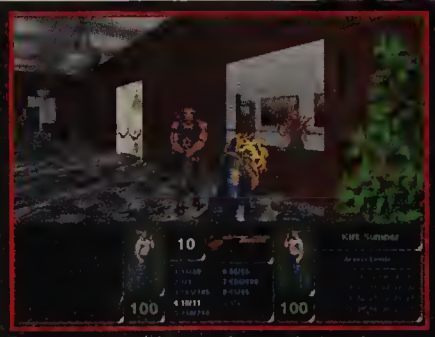
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Mac Superguide

MACWORLD SELECTS THE BEST MAC OS SYSTEMS

Looking for a new Macintosh but confused about which of all the new models to buy? Look no further. Each month, the *Mac Superguide* section provides *Macworld*'s picks for the best Mac OS systems. Typically we recommend three top choices: an Editors' Choice winner and two runners-up. Occasionally we'll have more or fewer top choices in categories with unusually competitive—or uncompetitive—options.

You'll also find *Macworld* Star Ratings and Macworld Lab performance benchmarks for all Mac OS systems shipping as we went to press in late December 1996. You may read about other Mac models in *Macworld* and elsewhere, but those are prototypes not yet available—the only systems rated here are those you can actually buy.

For Mac systems reviewed earlier, the summaries below include the issue date and page number of the article. In some cases, such as faster versions of existing Macs, there is no full review and thus no cross-reference. New systems are indicated in the benchmark by the ▶ icon.

Star Ratings and Editors' Choice designations may have changed since previous issues, based on the current lineup of systems and any price changes; the winners listed here are the current ones.

All prices but Power Computing's are company-estimated street prices; actual price may vary. Power Computing sells direct, so the prices listed here are the ones you would actually pay. Unless otherwise noted, all systems include a keyboard and mouse, but not a monitor or modem. Apple systems do not include a keyboard except for Performa and PowerBook models. DayStar systems do not include a hard drive, RAM, keyboard, or mouse, although we add their cost in determining the prices reported here.

For price comparisons, figure on spending about $800 for a monitor and, if they're needed, $175 for a 28.8-Kbps or 33.6-Kbps modem, $100 for an extended keyboard, $50 for a mouse, $750 for a 2GB hard drive, $125 for 2MB of VRAM, and $275 for 16MB of RAM.

OFFICE SYSTEM

Editors' Choice

★★★★/7.3 **PowerCenter 150** A great price, plus more expansion and better performance than Apple's Power Mac 7600/132, make the PowerCenter 150 minitower the ideal general-purpose office Mac for most people. Power Computing does skimp on the video RAM but is generous on the cache. Power Computing (512/388-6868): $2095, 16MB RAM, 512K cache, 1MB VRAM (4MB maximum), 1.0GB hard drive, 8× CD, 3 free drive bays, 3 PCI slots. *Dec 96, p. 106*

Editors' Choice

★★★/6.9 **SuperMac J700/180** Top speed for an office Mac and good expansion capabilities distinguish this desktop system from others. It's a bit pricey, but the extra money gives you a real performance difference. Umax Computer (510/226-6886): $3095, 16MB RAM, 512K cache, 2MB VRAM (4MB maximum), 2.1GB hard drive, 6.7× CD, 2 free drive bays, 4 PCI slots. *Feb 97, p. 37*

★★★/6.2 **Power Macintosh 7600/132** Thanks to a recent price reduction, Apple's flagship office Mac is now only $200 more than the PowerCenter 150. While the 7600 is a bit slower and less expandable than the PowerCenter, it is nonetheless a strong performer. An added bonus for some people is the built-in video-input circuitry. Apple Computer (408/996-1010): $2295, 16MB RAM, 256K cache, 2MB VRAM (4MB maximum), 1.2GB hard drive, 8× CD, 1 free drive bay, 3 PCI slots. *Dec 96, p. 106*

The Umax SuperMac J700/180 brings tower-level performance and expansion to the desktop.

PORTABLE SYSTEM

Editors' Choice

None Apple's portables have been lackluster recently, and none warrants this ultimate recommendation.

★★★/6.4 **PowerBook 1400cs/117** Apple's newest notebook accommodates an optional CD-ROM drive. The result is a better system than the old 5300 series, but no barn burner. The new, larger LCD screen is nice, even though it's passive matrix. Apple Computer (408/996-1010): $2495, 12MB RAM, 750MB hard drive, optional 6× CD, 11.3-inch passive matrix LCD, 1 drive bay, 2 PC Card slots ($3500 model 1400c/117 has active matrix LCD and 1.0GB hard drive). *Jan 97, p. 58*

★★★/5.9 **PowerBook Duo 2300c/100** A lot of power in a small package, this system could double as a desktop if you use a docking station. However, it's not cheap. Apple Computer (408/996-1010): $4699, 20MB RAM, 1.1GB hard drive, 14.4-Kbps modem, 8.5-inch active matrix LCD. *Apr 96, p. 58*

SMALL-OFFICE/HOME-OFFICE SYSTEM

Editors' Choice

★★★★/7.6 **PowerBase 240** Pro-level performance for a price comparable to that of Apple's Performa 6400/200, plus a strong selection of features and greater expansion capability, make this hard-to-get tower a great buy for consultants and small businesses. Power Computing (512/388-6868): $2295, 16MB RAM, 256K cache, 2MB VRAM (4MB maximum), 1.2GB hard drive, 8× CD, 3 free drive bays, 3 PCI slots. *Jan 97, p. 60*

Apple's Power Mac 5400/180 offers the right mix of price, simplicity, and performance for schools.

★★★★/7.4 **Performa 6400/200** Good performance contrasts with limited internal expansion. But a good price makes this tower more attractive despite its limitations. A unique feature is its TV tuner slot. Apple Computer (408/996-1010): $2119, 16MB RAM, 256K cache, 1MB VRAM (1MB maximum), 2.4GB drive, 8× CD, 1 free drive bay, two 7-inch PCI slots, TV/FM tuner slot, 28.8-Kbps modem. *Dec 96, p. 106*

EDUCATION SYSTEM

Editors' Choice

★★★★/7.3 **PowerBase 180** Strong performance, low price, good expandability, and features such as 3-D video acceleration make this tower a great buy for cash-strapped schools and students. Power Computing (512/388-6868): $1595, 16MB RAM, 256K cache, 2MB VRAM (4MB maximum), 1.2GB hard drive, 8× CD, 3 free drive bays, 3 PCI slots. *Jan 97, p. 60*

Editors' Choice

★★★★/7.1 **Power Macintosh 5400/180** This all-in-one Mac—available only to schools—eliminates the need for several cables that could get damaged or stolen in a school setting. Rich in features—including a good monitor—and moderate in speed, the 5400 is a good classroom Mac. Apple Computer (408/996-

REAL PRODUCTS REAL RATINGS Reviews you can trust: Unlike other publications, Macworld rates only final shipping products, not prototypes. What we review is what you can actually buy. Outstanding ★★★★★ = 9.0–10.0 Very Good ★★★★ = 7.0–8.9 Good ★★★ = 5.0–6.9 Flawed ★★ = 3.0–4.9 Unacceptable ★ = 0–2.9

1010): $1999, 16MB RAM, 1MB VRAM (1MB maximum), 1.6GB hard drive, 4× CD, no free drive bays, 7-inch PCI slot, TV/FM tuner slot, Ethernet card, internal stereo speakers, monitor included.

IMAGE-EDITING AND 3-D GRAPHICS SYSTEM

Editors' Choice

★★★★/7.4 **Genesis MP 720+** The ultimate Mac system speeds through multiprocessor (MP)–enabled programs like Adobe Photoshop and Strata StudioPro Blitz. Its high expandability means you could equip it with an internal RAID system and a recordable CD-ROM drive and still have free bays. The oversize tower is a bit imposing, but it leaves room for everything you might need. DayStar Digital (770/967-2077): $10,714, 16MB RAM, 512K cache, 4MB VRAM (4MB maximum), 2.0GB hard drive, 8× CD, 7 free drive bays, 6 PCI slots. *Dec 96, p. 120*

★★★★/7.5 **Power Macintosh 9500/180MP** A solid second in performance at half the price—a terrific deal for pros who need a multiprocessor system. The case doesn't hold as much as the Genesis MP's, and it's not as easy to add internal peripherals, but it's still sizable. Apple Computer (408/996-1010): $5199, 32MB RAM, 512K cache, 2MB VRAM (4MB maximum), 2.0GB hard drive, 8× CD, 2 free drive bays, 6 PCI slots. *Dec 96, p. 120*

Power Computing's PowerTower Pro 225 offers ultimate Mac performance at an affordable price.

★★★★/7.2 **Genesis MP 360+** Like the Genesis MP 720+, the MP 360+ features a cavernous tower case to hold an impressive array of peripherals. Like the 9500/180MP, it offers strong performance at a lower price than the 720+. But the 9500/180MP is a better deal unless you need the internal expansion. DayStar Digital (770/967-2077): $7814, 16MB RAM, 512K cache, 4MB VRAM (4MB maximum), 2.0GB hard drive, 8× CD, 7 free drive bays, 6 PCI slots. *Dec 96, p. 120*

PUBLISHING AND DESIGN SYSTEM

Editors' Choice

★★★★/8.0 **SuperMac S900/225** Nearly as fast as Power Computing's PowerTower Pro 225 for a significant $700 less, and with an extra free drive bay, the SuperMac S900/225 is the best high-performance deal around. The S900 also has an easier-to-upgrade case design than competing Apple and Power Computing towers. Expect availability to be limited until late winter 1997 as chip production ramps up. Umax Computer (510/226-6886): $4295, 16MB RAM, 512K cache, 8MB VRAM (8MB maximum), 2.1GB hard drive, 8× CD, 4 free drive bays, 6 PCI slots. *Dec 96, p. 120*

Editors' Choice

★★★★/7.9 **PowerTower Pro 225** The fastest single-CPU Mac offers the top performance needed for publishing pros. For many people, the $700 extra cost compared to the Umax SuperMac S900/225 won't be worth the 5 percent faster performance. Although the included Speed Doubler software increases the Pro 225's performance difference, you can buy that software for about $70 and still pocket more than $600 in savings. Power Computing (512/388-6868): $4995, 16MB RAM, 1MB cache, 8MB VRAM (8MB maximum), 2.0GB hard drive, 8× CD, 3 free drive bays, 6 PCI slots. *Dec 96, p. 120*

★★★★/7.8 **SuperMac S900/200** Running close behind the 225MHz Macintoshes at a great price, this system is an excellent choice for the cost-conscious power user. Umax Computer (510/226-6886): $3795, 32MB RAM, 512K cache, 8MB VRAM (8MB maximum), 2.1GB hard drive, 8× CD, 4 free drive bays, 6 PCI slots. *Dec 96, p. 120*

MULTIMEDIA AND VIDEO CREATION SYSTEM

Editors' Choice

★★★★/7.4 **Genesis MP 720+** The ultimate Mac system speeds through multiprocessor (MP)–enabled programs like Adobe Premiere and After Effects. Its oversized tower case's high expandability means you could equip it with an internal RAID system and a recordable CD-ROM drive and still have free bays. DayStar Digital (770/967-2077): $10,714, 16MB RAM, 512K cache, 4MB VRAM (4MB maximum), 2.0GB hard drive, 8× CD, 7 free drive bays, 6 PCI slots. *Dec 96, p. 120*

WEB AND INTRANET SERVER SYSTEM

Editors' Choice

★★★★/7.8 **SuperMac S900/200** With great performance at a great price, plus a simple-to-upgrade case design and plenty of expansion capability, this system is well suited to being a departmental intranet or moderate-demand Web server. Umax Computer (510/226-6886): $3795, 32MB RAM, 512K cache, 8MB VRAM (8MB maximum), 2.1GB hard drive, 8× CD, 4 free drive bays, 6 PCI slots. *Dec 96, p. 120*

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▶ New this issue.
Editors' Choice winners in red.

	Core Mac Performance	Star Rating*
Apple Computer		
Performa 6360	4.0	★★★/5.3
Performa 6400/180	4.0	★★★/6.6
Performa 6400/200	5.6	★★★★/7.4
PowerBook 1400c/117 ***	2.7	★★★/6.4
Power8ook 1400cs/117	2.8	★★★/6.4
Power8ook Duo 2300c/100 ***	2.3	★★★/5.9
Power Macintosh 5260/120 **	2.6	★★★/5.5
Power Macintosh 5400/180 **	4.3	★★★★/7.1
Power Macintosh 6400/200 **	4.5	★★★/6.4
Power Macintosh 7200/120	4.1	★★/4.8
Power Macintosh 7600/132	5.0	★★★/6.2
Power Macintosh 8500/150	5.9	★★★/6.2
Power Macintosh 8500/180	6.7	★★★/6.4
Power Macintosh 9500/180MP	6.9	★★★★/7.5
Power Macintosh 9500/200	7.7	★★★/6.8
DayStar Digital		
Genesis MP 360+	7.4	★★★★/7.2
Genesis MP 720+	7.3	★★★★/7.4
Motorola Computer Group		
StarMax 3000 DT603e-160	5.1	★★★/5.7
StarMax 3000 DT603e-200	5.8	★★★/6.8
StarMax 3000 MT603e-160	5.1	★★★/5.5
StarMax 3000 MT603e-200	5.8	★★★/5.8
StarMax 4000 DT604e-160	6.6	★★★/6.2
StarMax 4000 MT604e-160	6.9	★★★/6.0
StarMax 4000 MT604e-200	7.7	★★★/6.0
Power Computing		
PowerBase 180	5.4	★★★★/7.3
PowerBase 200	5.8	★★★★/7.3
PowerBase 240	6.4	★★★★/7.6
PowerCenter 150	5.6	★★★★/7.3
PowerTower 180e	7.9	★★★★/7.1
▶ PowerTower 200e	8.2	★★★★/7.1
PowerTower Pro 180	7.8	★★★★/7.6
PowerTower Pro 200	8.5	★★★★/7.7
PowerTower Pro 225	9.2	★★★★/7.9
Umax Computer		
SuperMac C600/180	5.2	★★★/6.2
SuperMac C600/200	5.8	★★★/6.2
SuperMac C600/240	6.3	★★★/6.5
SuperMac J700/180	7.3	★★★/6.9
SuperMac S900/200	8.3	★★★★/7.8
SuperMac S900/225	8.8	★★★★/8.0

	Multiprocessor Performance	Star Rating*
Apple Power Macintosh 9500/180MP	1.8	★★★★/7.5
DayStar Genesis MP 360+	1.8	★★★★/7.2
DayStar Genesis MP 720+	2.6	★★★★/7.4

**Based on features, implementation, innovation, performance, reliability, ease of use, and value. (See Star Ratings section for full explanation.) **Available only to educational institutions. ***Had less than 32MB of RAM, so some tests were conducted with virtual memory, which slows performance.*

Behind Our Tests

For details on our methodology, see *Mac Superguide*, January 1997.—**Macworld Lab testing supervised by Mark Hurlow**

★★★/6.8 **Power Macintosh 9500/200** A bit pricey for a server, the 9500/200 did offer the best Net server performance in Macworld Lab tests, edging out the less-expensive SuperMac S900/200. Apple Computer (408/996-1010): $4195, 32MB RAM, 512K cache, 2MB VRAM (4MB maximum), 2.0GB hard drive, 8× CD, 2 free drive bays, 6 PCI slots. *Dec 96, p. 120* m

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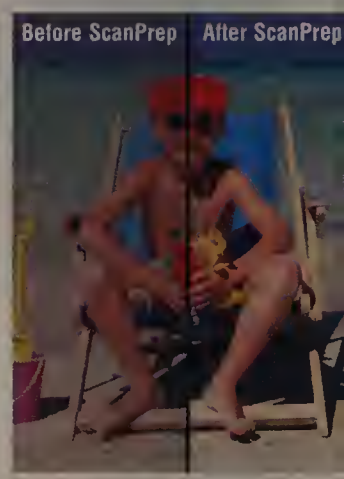

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DRAMATI

The 20th ANNIVERSARY MACINTOSH

OLLECTOR'S ITEM MARKS TWO DECADES OF DESIGN INNOVATION

BY PAUL KUNKEL For the past three and a half years, Apple has been working on a product whose design is as radical as the original Macintosh was in its day. ••• Like the first Mac, this one began with a small group of designers and engineers who were driven by a bold idea—to pack the functionality and performance of a high-end Mac into a design that would have maximum visual impact but consume minimal desk space, then wrap it in upscale materials such as leather, fabric, and polished metal that one would associate with a sophisticated home rather than a classroom or office. ••• Sound surprising? Not to those who have seen the slick concepts that come from Apple's Industrial Design Group (see "Inside Apple's Design," *Macworld*, May 1995). The surprise is that Apple has finally turned one of these designs into something real.

Special Edition The luxe Twentieth-Anniversary Macintosh is a home entertainment center as well as a computer. The curved desktop unit connects to a Bose Acoustimass subwoofer, which sits on the floor and also contains the computer's power supply. The computer's hooped foot folds up to serve as a carrying handle and allows the keyboard to be stored underneath. (Final product details may differ from this prototype unit.)

PHOTOGRAPHS BY RICK ENGLISH

A SLIM ENCLOSURE COMBINES THE LOOK OF THE ORIGINAL MAC WITH THE LUXURY

Home Entertainment Hybrid

Known as the Twentieth-Anniversary Macintosh, this hybrid product combines the functionality of a computer with that of a home entertainment center. Apple CEO Gilbert Amelio is scheduled to unveil its design during his keynote at the Macworld Expo in San Francisco on January 7. An official product launch is slated to follow at Macworld Tokyo in February, with products shipping in late spring.

Inside, you'll find at least a 200MHz PowerPC 604e CPU (or a faster chip, if the final design can accommodate the heat it would generate), a 3-D–graphics accelerator chip, and 32MB of RAM (expandable to 128MB), with a 12.1-inch active matrix color LCD panel. There's also a PCI expansion slot; a communications slot for a modem or Ethernet card; a PowerBook-size floppy drive; a 2GB hard drive; and a slim, vertically mounted 4× CD-ROM drive (the fastest drive that can function in an upright position). Everything is packed together as tightly as the components inside a PowerBook.

Entertainment-related components include a cable-ready TV tuner (with a handheld remote), an AM/FM tuner, and a 40-watt stereo amplifier connected to a Bose sound system, with upper- and mid-range speakers mounted at the sides of the display and a subwoofer on the floor that sounds so good, it could easily replace your home stereo. (The start-up chime will make you jump the first time you hear it.)

Objet d'Art

The Twentieth-Anniversary Macintosh is also a piece of desktop sculpture, with the components housed in an impossibly slim curved enclosure that combines the all-in-one look of the original Mac with the svelte luxury of a Bang & Olufsen stereo system. The subwoofer and the Mac's power supply, linked to the main unit by a half-inch-thick cable, reside in a separate oval enclosure that resembles the smokestack on a 1930s ocean liner, with a rubber ring around the top. Visually, it's a knockout.

Aimed at hard-core aficionados and wealthy collectors, this new Mac is mainly a commemorative item celebrating Apple's 20th year on the planet—a three-dimensional thank-you note to the millions of Mac fans who remained loyal through the recent dark period, as well as a reminder to the PC crowd that the people in Cupertino still make the most innovative products around.

The Twentieth Anniversary Mac also serves as the opening salvo in a marketing and product-announcement blitz that Apple calls its "third decade"—the first in a new line of desktop Macintoshes, printers, displays, and portables that the company will unveil in 1997 (see the sidebar, "Apple's New Design Direction").

Now for the bad news. Apple plans to sell no more than 20,000 of these units, which means that putting this dream machine on your desktop could be as difficult as buying a ticket to the World Series. Be prepared to shell out around $9000—a stiff price for a product that offers good, but not great, performance. But before you throw up your hands, take a look.

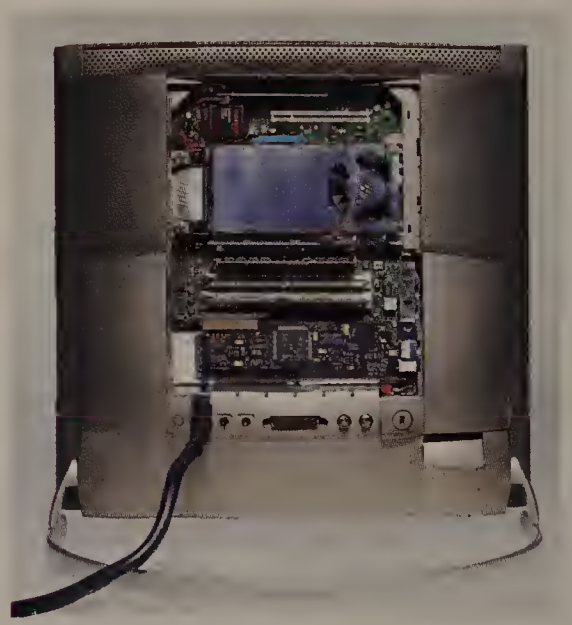
Firsthand Experience

When you sit in front of the machine, everything is new, yet still oddly familiar. Having the same upright stance as the original Mac, the front bezel is restrained, with the flat-panel display at the top and the vertically mounted CD-ROM drive below. Surrounding the CD drive are control buttons (for the CD-ROM, TV, AM/FM tuner, brightness, volume, and mute), a headphone jack, and an infrared window (for the TV remote)—all arranged on a graceful convex surface framed by narrow fabric-covered speakers that curve inward at the edges, focusing your attention on the screen.

As you cast your eyes around the side to view the back, you notice: there *is* no back—just a simple curved surface that kicks out at the bottom and leans against a hoop-shaped aluminum foot (known as a bale). The bale allows the machine to tilt at various angles and folds up to serve as a handle, so you can carry the new Macintosh under your arm just as you could the original. The computer measures 17 inches high and 15 inches wide, and weighs about 10 pounds.

To make the computer's case as small and thin as possible—less than 4 inches at its thickest point—Apple designed it around a standard desktop motherboard (the same one, called Alchemy, used in the Performa 6400), which sits directly

An Upright Stance So as not to interfere with the on-screen interface, the front of the design is quite restrained. The vertically mounted 4X CD-ROM drive (the fastest model that can function in an upright position) is surrounded by buttons for controlling display brightness and sound volume; accessing TV, AM/FM, and CD-ROM functions; and sound muting. The speakers are at the sides of the display; a separate subwoofer is also included.



Making Room Inside, the components are packed as tightly as those inside a PowerBook. Removing the back center panel reveals the motherboard, a PCI expansion slot (top left), a communications slot for adding Ethernet (right), and a lithium battery (bottom left), which may need changing around the year 2006. To fit add-on cards, you need to replace the slim center panel with an auxiliary panel, a "backpack," that kicks out near the top.

behind the display; mounted the floppy, CD-ROM, and hard drives around the board at three-, six-, and nine-o'clock positions, leaving almost zero clearance inside; and then tucked the TV tuner and I/O ports into the bulge at the back.

TV and AM/FM antenna ports, SCSI, 16-bit stereo microphone and headphone jacks, and a video-out port remain exposed. ADB, printer, and modem ports hide behind a locking door, making it easier to manage the cables.

With so much hardware packed into so little space, adding a card to the PCI or comm slot requires replacing the center of the back panel with an auxiliary panel (included with each unit). This "backpack" has a squarish protrusion near the top that allows clearance and cooling space for add-on cards. Those who want to preserve the original look can attach the 33.6-Kbps external modem, based on the GeoPort, which is also included with each unit.

The keyboard, which has leather wrist rests and a detachable PowerBook-style TrackPad, is slim enough to fit under the unit when it's not being used, for more efficient use of desk space.

Added Color

To go with its radical shape, the Twentieth-Anniversary Mac also has a new color—so new it doesn't yet have a name. A mixture of green and gold, it resembles bronze and has a subtle metallic quality that gives the surface a chameleon effect, absorbing and reflecting surrounding colors so that it works in almost any interior. Gray-green fabric speaker covers and black leather wrist rests on the keyboard complete the look.

The subwoofer on the floor contains the power supply and a Bose Acoustimass speaker encased in a series of specially designed baffles that make the incredible sound possible. To highlight the Bose connection, Apple allowed Bose to put its name on the subwoofer case, directly below the six-color Apple badge. The cross-marketing potential is obvious.

Indeed, everything about this new Mac will be marketed to the limit. To herald its arrival, Apple is assembling a lavish Web site where you will be able to place an order for the machine (the URL was

Sculptured Lines The industrial designers at Apple arranged the Twentieth-Anniversary Mac's components into an extremely thin curved panel, allowing the new Mac to function as a piece of desktop sculpture (seen here from the top), as well as a multimedia computer and home entertainment center.

Future Shock This all-in-one machine has a forward-looking design that seems remarkably simple, and a $9000 price tag that includes the cost of onsite setup and a leather-bound owner's manual.

not available at press time; use *http://www.apple.com*, click on Find It, and type **Twentieth Century** as keyword). QuickTime video tours will show how the board and components are laid out, how the bale is cast, how the case is molded and painted, final assembly at the factory, and other nifty details.

Is It Worth It?

With the cost of computer performance falling year after year, can any Macintosh be worth $9000? That depends. At a time when a Power Mac 9500 with a 200MHz 604e chip, 32MB of memory, a 2GB hard drive, an 8× CD-ROM, and a 33.6-Kbps modem can be had for less than $4500 (plus the cost of a display), the limited-edition Mac looks pricey. Artistic types will adore its beautiful lines. Music lovers will be amazed by its gutsy sound. But power users will wish it had a larger screen, a faster processor, and an 8× CD-ROM drive. Then again, don't judge this machine by specs alone. It's not about work. It's about Making a Statement.

To make sure its pricing was on target, Apple conducted focus groups with likely buyers in New York, Chicago, and Los Angeles; demonstrated the product at length; and then asked the participants to price it. Typical responses ranged from $8000 to nearly $10,000.

At nine grand apiece, these Macs are more likely to show up bolted inside a Learjet, positioned just so in a Trump Tower apartment, or sitting in a high-powered office in Milan or Djakarta than on the desk of the average Macintosh user. For this reason, each unit will be delivered by a specially trained "concierge" who will set it up, install add-on cards, instruct you in how to achieve maximum performance, then hand you a leather-bound owner's manual confirming you as one of the Chosen Few.

And after the final unit comes off the line, Apple promises to break the mold. Thus, unlike that of conventional computers, this one's value will probably rise over time (a limited-edition, all-white version of the PowerBook 170, which Apple issued in 1992, is now worth nearly $20,000). For that reason alone, buying a Twentieth-Anniversary Mac might

be a wise move. If you can't wait for the Web site, call the best-connected dealer you can find, place an order, then pray.

The Last Word

Not since the original Mac has Apple given us a more design-driven product—a true hybrid that delivers on so many levels that it redefines what we mean when we say the word *Macintosh*. The new design extends the all-in-one Mac into the future without losing touch with the original. With clone makers blurring the Mac's distinct physical identity and Apple seeming to have lost touch with its own design heritage, this new Mac comes not a moment too soon.

It's more than a bauble for the super-rich. It's a taste of things to come. Inside, it packs a wallop (of sorts). Yet on the outside, it speaks in a more controlled voice. What is it telling us? That Apple is back. Perhaps it never went away at all. **m**

PAUL KUNKEL, a freelance writer based in New York City, has just completed a book on the Apple Industrial Design Group (Graphis, 1997).

Apple's New Design Direction

Like the Twentieth-Anniversary Mac, Apple's future products will target specific markets by repackaging familiar technology in ways that are more user-oriented and task-specific.

Right at Home

Hints at future desktop designs appear in the Domesticated Mac concept, which recasts the Color Classic into a post-modern cabinet-on-a-stand, with twin doors (made of wood, metal, or other material) covering the screen when it's not in use. The soft plastic exoskeletons inside the doors rest against the screen, allow the user to tuck a note or a disk inside the door for quick access, and provide a place to mount a clock, which pivots inside an aperture on the door to the right. Rounded corners and sinuous (almost snake-like) lines of the surface indicate that future Macs will look more organic, with lively details that could make clone makers' products seem drab by comparison.

PAUL FRANZ-MOORE

Same Technology, Different Looks

The eMate 300 combines Newton technology with a keyboard in a sculpted translucent case. Aimed at the K through 12 education market, where space is limited, budgets are tight, and users are often intimidated by computers, the $800 product is small, brightly colored (note the red prototype), and specially tuned to fulfill a child's needs, expectations, and education.

An adult-oriented eMate, now under development, will have a more sober look—not unlike the new MessagePad 2000, which updates the notepad analogy used on previous Newtons by positioning the lid at the side, like a book cover. The stylus, which stores in an "inkwell" in the upper corner, can rotate the 2000's backlit screen from portrait to landscape mode. Screen data repositions automatically.

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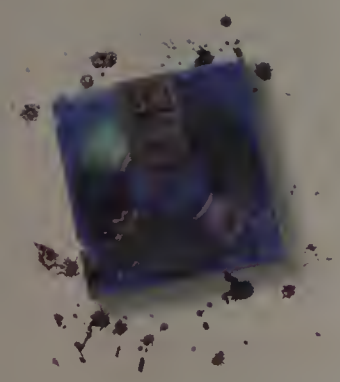

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Circle 202 on reader service card

Top to bottom: Polaroid PDC-2000/40, Kodak DC20, Ricoh RDC-2

Digital Cameras

by Deke McClelland

Picture It Now

For instant gratification, snap up a digital camera

IF YOU WANT to strike up a conversation with an absolute stranger—and have the stranger make the first move—whip out a digital camera. Never in my life have I had so many people peek over my shoulders and proffer unsolicited inquiries as I have when snapping computerized photos. On a recent trip abroad, bodies routinely clustered around me every time I fired off a shot of a stunning landmark or picturesque café. Imagine my relief upon discovering that they didn't covet my wallet; they merely craved a piece of my Polaroid.

Digital cameras entice by promising immediate gratification and unprecedented flexibility. You can take as many pictures as you want without incurring development costs, correct and modify the images as you please, and store them forever without risk of scratching or fading. And that's just the beginning.

Depending on the camera, you can precisely frame your subject on an LCD screen, switch out the storage media when the camera's memory fills up, and delight friends and family with your pictures the very same day you shoot them—all without so much as connecting the camera to a computer. Provided that you're willing to accept today's technology trade-offs, such as low resolution and choppy image quality, these cameras are a shutterbug's dream come true. In time, they are certain to make consumer film cameras as obsolete as Super 8 movie projectors.

Professional-quality digital cameras have been around for a while now, but the low end is where the action is. Ever since Apple (*http://www.apple.com*) presented its groundbreaking QuickTake three years ago, I haven't encountered a single consumer-level camera that hasn't pushed the envelope in ease of use, convenience, and sheer picture-snapping joy. This time around I looked at ten digital cameras, from the midrange $3695 Polaroid (*http://www.polaroid.com*) PDC-2000/40 to the pint-size $350 Kodak (*http://www.kodak.com*) DC20. Except for the Polaroid model, all of these cameras can be had for under $1000, and three fall below the $500 mark.

Bear in mind that at this price point you can't expect pictures on a par with 35mm prints. With the exception of the Polaroid, these cameras vary little in terms of resolution, and their output certainly doesn't measure up to Kodak's Photo CD or 35mm slides processed with a scanner. So in judging the cameras, I looked at four criteria that seem more in keeping with the current state of technology: storage capacity, color accuracy, extras like LCD previews and zoom lenses, and software. Which camera is best for you depends on the criteria you value most, and just how much you're prepared to spend.

The current prices may not be your idea of inexpensive, and the image quality is still a ways from picture-perfect. But if you desire immediate results and your own on-screen darkroom, then there's nothing quite like digital cameras. They merge the immediacy of videotape with the postproduction control only pixel-based media can provide. Film may not be dead yet, but its emulsion is drying up and blowing in the wind.

Housing All Those Pixels

Digital cameras may be the only variety of hardware that seems to be priced according to how big it is and how much it weighs. The most expensive camera, the Polaroid PDC-2000/40, is an awkwardly shaped 2-pounder that doesn't feel quite secure in any of the camera bags I own. In contrast, the inexpensive Kodak DC20 is a 4-ounce model that slides easily into a shirt pocket. Most of the others fit snugly into a fanny pack. The oversize exceptions are the Apple QuickTake 150 and Kodak DC50, both of which are based on older housing designs.

Photographic Memory The primary reason behind the difference in bulk is storage capacity and gadgetry. The DC20 can afford to be dinky because it contains a scant 1MB of memory and no extras whatsoever. You can take just eight undersize pictures before you have to return to your computer and download them. In contrast, the PDC-2000/40 has 40MB of on-board memory—ten times as much as any other model and enough to store 40 images of a million pixels each.

Some cameras permit you to augment the memory with specialized cards. The Kodak DC50 and the Ricoh (*http://www.ricohcpg.com*) RDC-2 offer PC Card slots. For about $300, you can increase either camera's capacity by another 50 images. The cards aren't intended for permanent storage—you erase them after transferring the photographs to your hard drive—so you can use them repeatedly and even switch them to another camera.

PC Card Alternatives Even credit card–size PC Cards can bloat the size of the housing. Fuji Photo Film (*http://www.fujifilm.com*) shaved a few inches off its DS-7 by opting for a smaller removable card called the SmartMedia. About the size of a watch face and thinner than a dime, these bits of plastic hold up to 30 screen-size images apiece. It's like something out of *Mission: Impossible*—easily the smallest removable media I've seen.

The Epson (*http://www.epson.com*) PhotoPC also lets you expand the storage, but it does a poor job of it. You can insert a 2MB or 4MB circuit board into the casing, but once you make your decision, you're stuck with it. Epson won't let you swap a full board with a fresh one or upgrade the board from 2MB to 4MB. It's hardly better than no expandability at all.

The World as You See It

While lots of pixels and large storage capacity are important, they alone aren't sufficient reason to purchase a camera. But as luck would have it, the most storage-intensive device also shoots the best pictures. The PDC-2000/40 captures colors more accurately than cameras costing three times as much. And while the detail tends to be a little soft, you can easily correct the focus in Adobe Photoshop or another image editor without fear of bringing out JPEG artifacts (geometric patterns that JPEG creates to facilitate compression and reduce file size).

The Best Midrange Color The next best cameras after the PDC-2000/40 in terms of color quality are the two Kodak devices—the DC20 and the DC50—and the D-200L from Olympus (*http://www.olympus.com*). Though not quite as accurate as the PDC-2000/40, the Kodak cameras produce rich, saturated colors with expertly understated highlights and shadows. The D-200L produces brighter colors—sometimes a tad garish—and surprisingly crisp details, a fact that Olympus attributes to its all-glass lens design.

When using the D-200L's flash, however, I encountered problems with clipping—where pixels that ought to be white are misinterpreted as black in one or more color channels. (Color channels are the layers of red, green, and blue primary light that mix to form the colors you see on screen.) In one image, the highlights on a smiling girl's teeth turned bright blue, thanks not to the wrong brand of toothpaste but rather to inexplicably black pixels in the red color channel.

Wayward Hues In a digital environment, we take for granted that many color problems are correctable. However, some problems don't lend themselves to repair. For example, many of the cameras suffered from blown highlights, in which large areas of an image turn absolutely white, resulting in flat "hot spots" that give the image an overexposed appearance. No image editor lets you restore detail where none exists.

The Casio (*http://www.casio.com*) cameras—the QV-10A and QV-100—and the Ricoh RDC-2 are the worst highlight offenders, with around 10 to 20 percent of their images beyond repair. These cameras also had significant color-cast problems, with the Casio models favoring violets and greens and the Ricoh overstating blues and yellows. The higher-resolution and more expensive QV-100 produced the most errant colors of all—not only clipping and blowing highlights, but also producing mottled patterns in open patches of sky and water—ultimately it was the least satisfactory camera of the lot.

Point, Click, and Ogle

The other big criterion for digital cameras is usability, and here a behemoth like the PDC-2000/40 comes up short. Though it's blessed with autofocus and an excellent fill flash (a subtle flash that fills in

A Question of Quality: Image Color and Resolution Vary

Polaroid PDC-2000/40

Ricoh RDC-2

Casio QV-10A

For image quality, the PDC-2000/40 (left) is far and away the best camera under $5000. The color is unfailingly accurate; while the images initially appear soft, the low compression makes sharpening a breeze. The RDC-2 has good image resolution, but the color response is flawed, as the center example shows. The QV-10A is limited to itsy-bitsy 320-by-240-pixel pictures (downsampled from 480 by 240)—just 12 percent as many pixels as the PDC-2000/40 captures. The QV-10A's color response tends toward purple, with occasional green flares.

shadows), the camera lacks previewing and zoom capabilities. You can erase individual pictures, but unless you label each picture as you take it—an unwieldy chore that only the fussiest of fussbudgets might attempt—you have no idea which picture is which until you cable the camera to your computer. Add in its strange penchant for flash and focusing delays, and you have one challenging piece of hardware. The best digital camera also happens to be the most difficult to use.

The most straightforward cameras provide LCD screens that allow you to preview and play recorded images. You can frame images every bit as well as when using a camcorder, because what you see is precisely what you get. At the end of the day, after you've gone and snapped everything that attracted your wandering eye, you can peruse your pictures and delete the ones that look too atrocious for words. Only LCD cameras permit you to assess pictures without the aid of a computer.

Screening the Competition The Casio QV-10 was the first digital camera to feature an LCD preview, but one year later Casio is at the back of the pack. The QV-10A and QV-100 offer clunky previews that update just a few times per second. Meanwhile, the DS-7, D-200L, and RDC-2 have screen refresh rates as high as 60 times a second, sufficient to pro-

The Happy Death of VHS

If you're excited by snapping digital still photographs, imagine the possibilities when you're filming fully digital movies. No more worrying about magnetic VHS or 8mm tapes' degrading over time, no more flickering pauses, no more half-baked audio—your home or business videos can enjoy the same boost in quality and integrity that compact disc technology brought to music.

I suppose the ideal digital camcorder might capture high-resolution QuickTime movies, or at least record to a durable, searchable medium, like a miniature laser disc. But the current generation of digital video cameras record to cassette tapes, similar to digital audiotapes (DATs). The tapes have the same potential for stretching and mangling as analog videotapes; the primary difference is that frames are converted to discrete binary signals instead of relatively muddy electromagnetic waves. Even if the tape gets chewed, the playback device stands a reasonable chance of reading and correctly interpreting the data.

I tested the $3595 consumer-level Sharp (800/237-4277, *http://www.sharp-usa.com*) VL-DC1U Digital Viewcam. Like many recent digital still cameras, the VL-DC1U features a high-speed LCD preview, but the 4-inch screen covers about four times the area of the still-camera LCDs. The Mini DV tape is slightly smaller than a DAT, or about half the size of an 8mm tape (picture a stack of credit cards). The tapes are expensive, costing $30 for 60 minutes of recording time, but they make for compact camcorders. Weighing a scant 29 ounces, the VL-DC1U is slightly shorter and narrower than a VHS tape.

The VL-DC1U boasts CD-quality (16-bit, 48KHz) stereo sound with sharp, colorfast images, more in line with professional-quality BetaCam than Hi-8 or S-VHS images. But don't expect to use a digital video camera as a still-camera substitute. Like any NTSC device such as a TV, a digital video camera records interlaced frames with alternating even and odd fields. And although the camera purports to record 410,000 square pixels, comparable in resolution to the Ricoh RDC-2, there's no way to dump the data directly to your disk. You have to transfer the data via an S-Video link to your computer's AV board, just as you would with a standard analog camcorder.

But if you've ever tried to capture pictures from S-VHS or comparable media, digital makes all the difference. As the sample frame grab "More to It" shows, the colors may not be as on-target as those captured by the PDC-2000/40, but they are stable and reliable. The VL-DC1U also features its share of digital extras, including time and date stamping (which you can view or hide when playing the tape), an interpolated zoom for up to 30× magnification, and a special brightness gain for interior and night filming. The camera design could use further work—the menu-driven controls are quite difficult to use, and I'd like to see a few digital postproduction tricks like flipping and cropping—but all in all, it makes VHS look about as relevant to the next decade as the eight-track tape is to ours.

PAUL FRANZ-MOORE

Video Goes Digital Like many of the new digital video cameras, Sharp's VL-DC1U features a nice-size LCD preview.

More to It Compare a movie frame (top) from the Sharp VL-DC1U with the same image shot with the similarly priced Polaroid PDC-2000/40 camera. Although I've sized the two images to include precisely the same number of pixels, the PDC-2000/40 photograph contains a lot more information (see the magnified views on the right).

duce a continuous and reliable preview. Because the LCD gobbles up battery power, the D-200L and RDC-2 also include standard viewfinders, which come in handy under bright conditions that render LCD screens unreadable.

Still, my favorite LCD camera is the Fuji DS-7. Every bit as compact as either Casio, the DS-7 supplies the most intuitive on-camera controls of the bunch, including a convenient brightness knob for the LCD, which the D-200L lacks. It properly acknowledges a voracious appetite for energy by shipping with four NiCd batteries and a charger. Except for the PDC-2000/40, the other cameras ship with disposable, short-lived alkaline cells.

Epson is planning to add a detachable LCD screen to its upcoming PhotoPC 500, and Kodak has plans for an LCD-equipped DC20 (dubbed the DC25). The latter especially needs a preview; the camera's tiny viewfinder and limited resolution make it nearly impossible to center a shot.

Zooming In If you're looking for bells and whistles, Ricoh's RDC-2 can't be beat. Its LCD screen is detachable, permitting you to lighten the load and shoot from the viewfinder. Two fixed zoom levels let you go in for a slightly closer look. And if you're a multimedia fan, you can record voice annotations and even take sequential pictures. It's all great fun, but it's hardly enough to distract from the fair-to-middling quality of its images. Frankly, Ricoh needs to work on getting a decent still picture before it dabbles in sounds and video.

If you're looking for a good zoom camera, the only practical choice is the Kodak DC50. It lets you zoom continuously up to 300 percent. Rather than superimposing a cheesy magnifying lens over the viewfinder, as with the RDC-2, the DC50's viewfinder magnifies continuously as well. Except when shooting close-ups, I have never had a problem framing images with this camera.

The Long Road to the Computer

The cameras' software for downloading images to disk is rarely implemented with the care invested in the hardware. Most cameras include utilities for batch-downloading photographs. But the utilities are often confusing and nonintuitive, requiring you to jump through unnecessary hoops and tossing out your images if you're not careful. Only the D-200L lacks a batch-downloading utility, providing nothing more than a Photoshop acquisition module; you have to open the images in Photoshop and save them one at a time, or devise a custom script from the Actions palette. (Olympus is aware of this problem and plans to offer batch-processing early in 1997.)

The DC20 ships with the most software, including a straightforward image-editing package from PictureWorks and the playtime utility Kai's Power Goo from MetaTools. Yet somehow, it takes more time to extract an image from a DC20 than from any other camera. The acquisition software requires you to preview an image before downloading it, a process that takes more than 30 seconds. Then you have to spend half again as long copying the image to disk.

All of the cameras except the QuickTake 150 have to decompress the images as they retrieve them. Of these, the speediest downloader is the Fuji DS-7, which takes about 7 minutes to clear out all 30 images from a standard 2MB SmartMedia card.

Snap Facts: The Range of Digital Camera Features

Company	Apple	Casio	Casio	Epson	Fuji Photo Film
					Editors' Choice
Product	QuickTake 150	QV-10A	QV-100	PhotoPC	DS-7
Star Rating *	★★★/6.2	★★★/5.8	★★/3.9	★★★/6.0	★★★★/7.1
Price **	$739	$399	$599	$499	$699
Other costs	none	none	none	4MB RAM, $250	none
Phone number	408/996-1010	201/361-5400	201/361-5400	310/782-0770	914/789-8100
Camera dimensions (W × H × D, in inches)	5.3 × 2.2 × 6.1	5.1 × 2.6 × 1.6	5.3 × 2.6 × 1.6	6.5 × 3.5 × 1.9	5.1 × 3.0 × 1.9
Weight (with batteries, in ounces)	17	9	9	14	12
Maximum image size (in pixels)	640 × 480	320 × 240	640 × 480	640 × 480	640 × 480
On-board memory	1MB	2MB	4MB	1MB	none
Expandable storage	no	no	no	yes	yes
Storage capacity (images at maximum size)	16	96	64	80 with 4MB card	30 with 2MB RAM (incl
Optics	fixed focus	fixed focus	fixed focus	autofocus	fixed focus
Closest focal distance (in inches)	10	4	4	24	3.5
Zoom function	no	no	no	no	no
Built-in flash	yes	no	no	yes	no
Image quality	good color, good detail	blown highlights, violet cast, acceptable detail	blown highlights, frequent clipping, acceptable detail	occasional blown highlights, bright colors, good detail	dark colors, red cast, acceptable detail
LCD preview and playback	no	yes	yes	no	yes
Selectively erase images	no	yes	yes	no	yes
Save Photoshop-compatible image previews	yes	no	no	no	no
Date-stamp photos	yes	no	no	yes	yes
Photoshop acquire module	no	yes	yes	yes	no
Time required to retrieve one image to disk in standardized format	3 seconds (300K/second)	24 seconds (14K/second)	32 seconds (28K/second)	20 seconds (45K/second)	14 seconds (64K/second)
Bundled image-editing software	PhotoFlash (Apple)	PhotoDeluxe (Adobe)	PhotoDeluxe (Adobe)	EasyPhoto (Storm)	PhotoDeluxe (Adobe)

** Based on features, implementation, innovation, performance, reliability, ease of use, and value. (See Star Ratings section for full explanation.)* *** All prices are company estimated, except for the Polaroid*

Closing In on Your Subject: Some Cameras Do It Better

Epson PhotoPC

Olympus D-200L

Kodak DC50

Framing is difficult with any rangefinder camera, so some cameras provide framing aids to help you center your shots. For example, the PhotoPC and Olympus take very similar pictures (left and middle). But the D-200L previews the subject on an LCD screen, permitting me to capture more sphinx and less empty sky. The DC50's zoom function is an even better framing tool; with 300 percent magnification, I can get right in the sphinx's face.

With the QuickTake 150 you mount the camera onto the desktop as if it were a disk and drag-copy the images to your hard drive. You can copy all 16 images from the camera in less than a minute. To open the images, you have to install a QuickTime-compatible system extension that decompresses each image on the fly. This adds a second or two to the open operation, but it's well worth it.

The Pick of the Pix

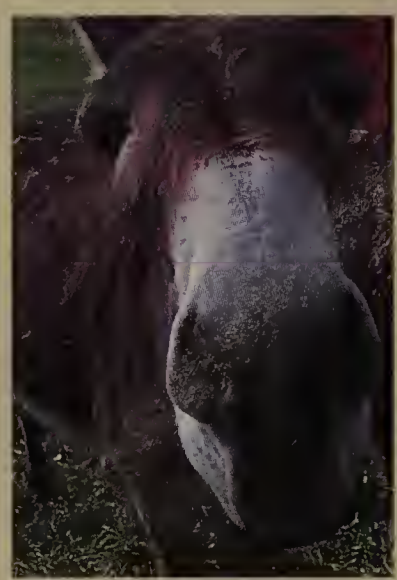
Digital cameras are still in early stages of development. To curb expenses, vendors have to pick and choose from a truckload of possible features. So the best camera for you depends on what you value most. If your number one concern is image quality, and you have some money to throw around, then the Polaroid PDC-2000/40 is your best bet. Whenever I set off to round up digital photographs, this is the first camera I grab.

If you want to keep your costs below $1000, you have two alternatives: zoom lens or LCD. (No digital camera I tested does a good job on both fronts.) If you want to magnify faraway subjects or frame pictures better without moving yourself or your subject, then the Kodak DC50 is the only way to go. Although marred by

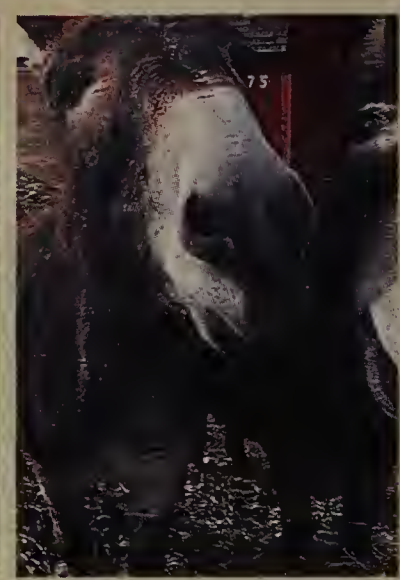
Kodak	Kodak	Olympus	Polaroid	Ricoh
	Editors' Choice		Editors' Choice	
DC20	DC50	D-200L	PDC-2000/40	RDC-2
★★/4.6	★★★/6.8	★★★/6.6	★★★★/7.9	★★★/5.8
$350	$979	$599	$3695	$999
none	5MB card, $300	none	none	5MB card, $300
716/724-4000	716/724-4000	516/844-5000	716/256-4436	702/352-1600
4.0 × 2.5 × 1.2	4.3 × 2.5 × 5.8	5.7 × 2.8 × 1.8	7.9 × 2.2 × 6.3	5.7 × 1.4 × 3.0
4	22	15	32	15 (18 with LCD)
493 × 373	756 × 504	640 × 480	1600 × 1200	768 × 576
1MB	1MB	2MB	40MB	2MB
no	yes	no	no	yes
8	63 with 5MB card	20	40	70 with 5MB card
fixed focus	autofocus	fixed focus	autofocus	autofocus
24	19	8	10	0.5
no	yes (3×)	no	no	yes (1.5×)
no	yes	yes	yes	yes
very good color, good detail	very good color, good detail	bright colors, occasional clipping, crisp detail	excellent color, soft detail (easily corrected)	blown highlights, blue-green cast, acceptable detail
no	no	yes	no	yes
no	no	yes	yes	yes
yes	yes	yes	yes	yes
no	yes	yes	yes	yes
yes	no	yes	yes	no
53 seconds (10K/second)	49 seconds (23K/second)	31 seconds (29K/second)	109 seconds (52K/second)	57 seconds (23K/second)
PhotoEnhancer (PictureWorks)	PhotoEnhancer (PictureWorks)	PhotoDeluxe (Adobe)	none	PhotoStudio (Microspot)

PDC-2000/40, which is a list price. Actual prices could be higher or lower than the estimated street price provided by the company.

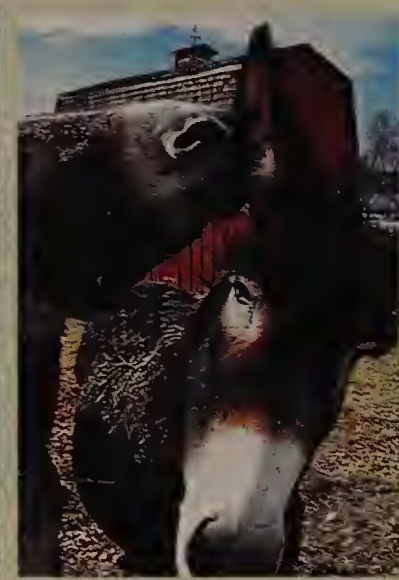
From Camera to Disk: The Poky Pace of Pixels



Kodak DC20 (53 seconds)



Fuji DS-7 (14 seconds)



Apple QuickTake 150 (3 seconds)

Digital cameras promise instantaneous gratification, but in some cases getting an image from camera to disk can be excruciatingly slow. The DC20 takes nearly a minute to select a single image such as the one shown and download it to a hard drive. The DS-7 takes only one-fourth as long. But by far the quickest downloader is the QuickTake 150, which lets you copy images without first decompressing them. In the time it takes to download one DC20 image, you can copy the full 16-image contingent from a QuickTake 150.

slow downloading and a boxy housing, it combines expandability, good image quality, and continuous zooming.

Many of the folks I've talked to seem to value LCD preview and playback over other considerations. If you fall into this camp, it's a close race between the Olympus D-200L and the Fuji DS-7.

The D-200L offers better image quality (despite its clipping problems), a built-in flash, and both an LCD screen and a traditional viewfinder. But I come down on the side of the DS-7, which provides expandability, batch-downloading software, closer close-ups (down to 3.5 inches), an LCD brightness knob, and four NiCd batteries and a charger. Plus it downloads images twice as fast as the D-200L. It's a tough call, but most casual users are likely to appreciate the DS-7's convenience features over the D-200L's sharper photographs.

The Last Word

If you've been waiting for an affordable, reliable digital camera, now is a good time to buy. The PDC-2000/40, DC50, and DS-7 are all significant improvements over what was available a year ago. Then again, if you keep waiting, things can only get better. The consumer market promises to explode by the end of the decade, with more vendors, including Sony, Canon, and Agfa, joining the fray.

New hardware isn't the only exciting development looming in the future. Apple hopes to open up the digital camera market with the Image Capture Platform, a technology that permits developers to write applications for digital cameras with compatible microprocessors, such as the MPC823 from Motorola. The core image-capture software—QuickTime IC—might make digital cameras more customizable and less dependent on a host computer. For example, a developer might write a bit of code that instructs the camera to shoot a series of time-lapse images and output the frames as a QuickTime movie. Apple also suggests that images might be stitched together to create a panoramic QuickTime VR scene. Minolta has been named as a possible partner, but prototype cameras aren't due out until later this year.

Whatever the future brings, the primary advantages of digital cameras continue to be convenience and immediacy. If you insist on drum-scanner quality, you'll be disappointed. You can purchase an excellent 35mm single-lens reflex camera and develop 200 images to Photo CD for less than it costs to buy a DS-7—and the images will look a lot better than those shot with the PDC-2000/40.

But if you want pictures quick and want to be in charge of the development cycle, then digital cameras bring the world to your computer in record time. If you're a technology buff, I'm willing to bet you'll own a digital camera before the century is out. **m**

Contributing editor DEKE McCLELLAND (*http://www.dekemc.com*) has taken more than 5000 pictures using consumer digital cameras.

ENTRY-LEVEL DIGITAL CAMERAS

MW EDITORS' CHOICE

We judged digital cameras on color accuracy, storage, framing tools, and software. No camera gets it exactly right, so the best brand for you depends on which of the three following features you value most.

Image Quality

★★★★/7.9 **PDC-2000/40** Comparatively expensive and difficult to use, the PDC-2000/40 produces far and away the best images of the bunch. **Company:** Polaroid (716/256-4436, *http://www.polaroid.com*). **List price:** $3695.

Zoom Capability

★★★/6.8 **DC50** Good color, expandability, and an excellent zoom lens set the DC50 apart from the rest. **Company:** Kodak (716/724-4000, *http://www.kodak.com*). **Company's estimated price:** $979.

LCD Preview and Playback

★★★★/7.1 **DS-7** The DS-7's LCD screen makes framing and reviewing photographs so easy, a child could do it. **Company:** Fuji Photo Film (914/789-8100, *http://www.fujifilm.com*). **Company's estimated price:** $699.

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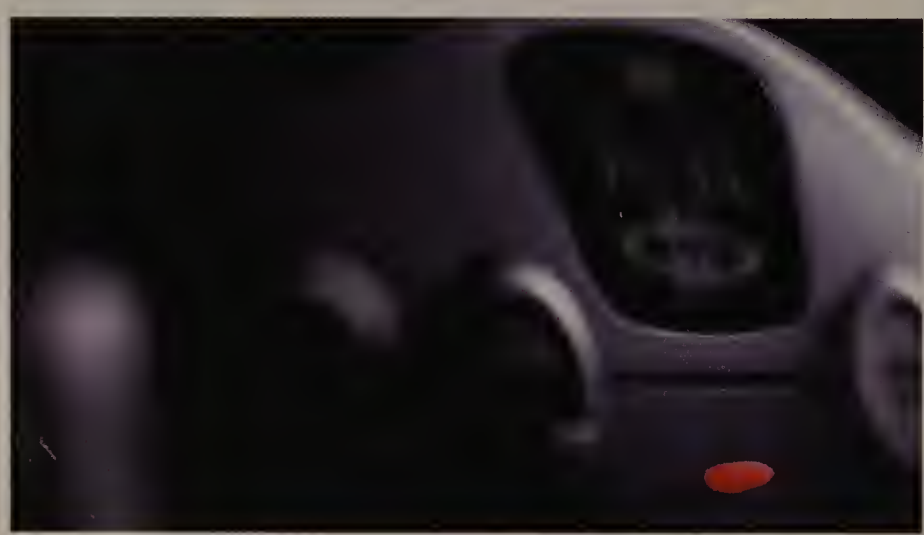

64-bit MIPS RISC Processing

Until now, it all seemed so predictable, 8-bit video gaming ruled the TV screen for five years. 16-bit gaming reigned for another five. But TV-based 32-bit gaming will be supplanted in a matter of months. Because in a heartbeat, Nintendo Ultra 64 will surpass everything that has come before. True 64-bit processing. 100 MHz system speed. 500 MHz memory speed. Real time rendered environments. Too much, too soon? Nope. More than enough — just in time.

What Game Designers are saying about Nintendo Ultra 64.

"Cutting edge advanced - everything else is antiquated." - Graphics like never before - either on the PC or any of the other game consoles."

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Design and art direction for the Nintendo Co., Ltd. 1995 annual report by Leimer Cross Design, Seattle. Photography by Tyler Boley.

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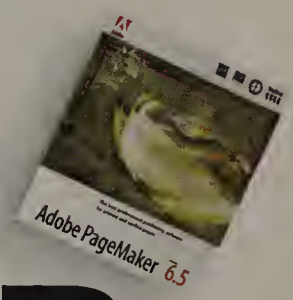

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MACWORLD'S 10TH ANNUAL

WORLD CLASS AWARDS

MACWORLD CELEBRATES THE BEST MAC PRODUCTS

It's been a difficult year for Apple and the Macintosh, one in which the company lost more than $800 million and admitted that two years of work on its Copland operating system were wasted. But tough times build character, and the Mac market saw many positive developments amid the gloom in Cupertino. Thanks in part to Apple's decision to sublicense the Mac OS to IBM and Motorola, 1996 featured a proliferation of clone manufacturers offering systems. Dozens of vendors showed their loyalty to the Mac platform by releasing useful and innovative products. And Apple's new management team made some important steps to turn the company around.

In this, our Tenth Annual World Class Awards, *Macworld* honors the products that have helped make the Macintosh the preferred platform for more than 25 million computer users worldwide. And, for the first time, we also recognize three individuals who made outstanding contributions to the Macintosh community in 1996.

What makes a product World Class? It can be one that makes you more efficient, or one that lets you express your creativity in new and different ways. It can be a simple e-mail client or a complex digital video editing package. But it must also be true to the qualities we've always associated with the Macintosh: easy to learn, easy to use, and imbued with a certain creative spirit.

This year, we honor 80 such products from 62 companies in 39 categories. To determine the winners and finalists, we cast a wide net. We consulted our editors and contributors. We tested products and ranked products' ratings. We polled more than 75 experts in the Macintosh community, including user-group leaders. In some cases we even conducted additional testing just to be sure.

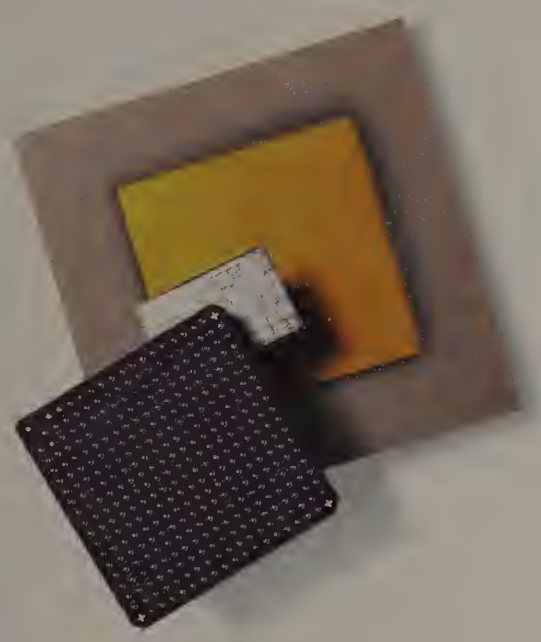
To be considered, products had to be shipping by November 29, 1996; but we did not restrict our candidates to those that had shipped in the previous 12 months. A great product is a great product, no matter when it becomes available. As a result, you'll see some familiar names, such as Adobe and Claris, and some new ones as well, such as Exponential Technology and Big Island Communications.

We've bestowed three special awards: for most significant technology, for most promising technology, and for what we consider to be the product of the year. Given that 1996 was a year of rebirth for the Macintosh, it's appropriate that two of these awards honor the fundamental of a computer system—the CPU—and the other recipient is a clone, Power Computing's PowerTower Pro 225. As last year's Macworld Expo opened, we predicted that this would be the year of the platform, and indeed it was.

Thanks and kudos to all those honored!

SPECIAL AWARD

MOST PROMISING TECHNOLOGY



X704

Applying semiconductor ideas from other computers and consumer electronics, Exponential Technology (*http://www.exp.com*) is on the fast track toward the processor of the future, a PowerPC-compatible chip that will fairly scream at 533MHz. Systems using the X704 chip are slated to debut later this year. Though Apple's mum about using the X704, it'd be funny if it didn't, since it owns a chunk of Exponential. And you can certainly expect the other Mac makers to pick up this chip for their next-generation speed demons.

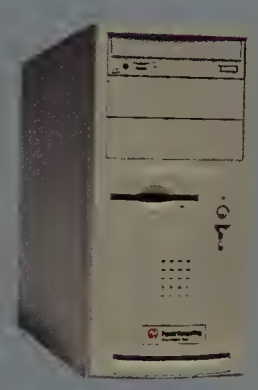
WINNERS • WIN

Systems

POWERBASE 240

Power Computing (*http://www.powercc.com*) struck gold at the entry level with this affordable and expandable system. For about $2200, you get a Mac comparable to a Power Mac 8500/180, and it has 3-D acceleration to boot. Power Computing to home market: Now you've got a choice.

Finalists: We've already gushed over the Power Computing PowerTower Pro 225, but it deserves to be said again: for power users, this system raises the clone manufacturing bar. At the same time, DayStar Digital's (*http://www.daystar.com*) dual-processor **Genesis MP 360+** has made multiprocessing on the Mac affordable.



POWERBASE 240

Storage

JAZ

Iomega's (*http://www.iomega.com*) Zip drive won in this category last year, but this year the honor goes to its hulking big brother. Walking around with a gigabyte in your hand brings on the same heady feeling of power that you get from ready cash and a full tank of gas.

Finalists: The Jaz's gigabyte of data is going to have to come to rest somewhere, hence our selection of Quantum's (*http://www.quantum.com*) **DLT** (digital linear tape) drives. They're available from a variety of vendors (the DLT technology actually originated with Digital Equipment Corporation), but our tests showed Quantum's model to be a speedy way to back up 25GB of uncompressed data. At the other end of the scale, we're also honoring a magneto-optical drive that's remarkably small and elegant, thanks to some intelligent design and miniaturization. Olympus Image Systems' (*http://www.olympus.com*) **Sys.230** drive costs more than a Zip drive, sure, but its cartridges cost half as much.

Input Devices

PAPERPORT VX

If we're ever going to reach the Holy Grail of the paperless office, this handy scanner and document-management software from Visioneer (*http://www.visioneer.com*) is going to lead the way. A true symbol of Thoreau's mandate to simplify.

Finalist: There's no easier way to scribble digitally than with Wacom's (*http://www.wacom.com*) **Erasing UltraPen**—especially for graphics professionals who change their minds a lot.

Display

PRESSVIEW SR 21

Although it's pricier than most monitors, Radius's (*http://www.radius.com*) PressView is once again our top pick for the way it incorporates color-management software so smoothly and displays colors so accurately that you can truly proof on screen.

No finalist.

Graphics Printers

PHASER 350

Richly saturated colors make Tektronix's (*http://www.tek.com*) solid-

PHOTOGRAPHY BY PAUL FRANZ MOORE

SPECIAL AWARD

PRODUCT OF THE YEAR

While PCs are chugging along at 200MHz, Power Computing's (*http://www.powercc.com*) PowerTower Pro has spurted ahead with this amazing speed boost. The megahertz rating isn't the only gauge of speed, but this is the fastest Mac we've ever tested. And in a year of concern about Apple's future, this system kept pumping new excitement into the Mac market. Admit it, didn't you want one, too?

POWERTOWER PRO 225

NERS • WINNER

ink entry a cost-effective knockout for anyone who hates red ink on the bottom line.

Finalist: Kodak's (*http://www.kodak.com*) **Digital Science 8650 PS** dye-sublimation printer dishes up output that's as good as that of printers costing twice as much.

Business Printers

PHASER 550

It's fast, it's got 1200-dpi resolution, and it's a color-laser printer with stunning output. Tektronix continues its dominance.

Finalist: If you're looking for a smashing addition to a small office or home office that needs to accommodate both Macs and PCs, look no further than Hewlett-Packard's (*http://www.hp.com*) **LaserJet 6MP**.

Personal Printers

STYLUS COLOR 500

So what do you want to print—presentations, photographs, newsletters, charts? This Epson (*http://www.epson.com*) powerhouse delivered all of them brilliantly.

Finalist: Apple's (*http://www.apple.com*) **Color StyleWriter 2500** represents a leap forward for Apple's ink-jet printers, with great output and networking options.

FILEMAKER PRO 3.0

System Utilities

CONFLICT CATCHER 3.0

If your computer is an engine and the operating system is its fuel, Casady & Greene (*http://www.casadyg.com*) provides this important STP counterpart that helps everything run cleanly and smoothly.

Finalist: Even though the price of RAM has dropped to comfortable levels, you can still benefit from loading up **RAM Doubler 2.0**, Connectix's (*http://www.connectix.com*) seemingly magical way of boosting performance.

Storage Utilities

RETROSPECT 3.0

Like flossing, data backup is a necessary part of life that you ignore at your own risk. At least Dantz Development's (*http://www.dan .com*) backup software is so eas to set up and configure tha you'd never confuse it with a tri to the dentist.

Finalist: If you've ever want a trouble-free way to keep yo hard disk lean and mean, FW Software's (*http://www.fwb.com* **HSM Toolkit 1.0** can help—it iden tifies little-used files and mov them to offline storage.

Personal Utilities

QUICKEYS 3.5

Are you typing more but enjoying less? CE Software's (*http://ww .cesoft.com*) tool for easily creatin macros and shortcuts is a godsen especially for Internet signatur and other priorities.

Finalist: If you think sendin mail over the Internet is slow no imagine what it would be like if n one could use Aladdin System (*http://www.aladdinsys.com* **StuffIt Deluxe 4.0** compressio software.

SPECIAL AWARD

MOST SIGNIFICANT TECHNOLOGY

POWERPC 604E

From the joint efforts of IBM Microelectronics (*http://www.chips.ibm.com*) and Motorola's (*http://www.mot.com/computer*) RISC Microprocessor division comes the latest processor powerhouse, keeping the Macintosh ahead of the competition at Intel. The original PowerPC was fast, but the new model is faster at what most programs use—integer calculations—not just at the floating-point calculations that have been a PowerPC hallmark since day one. And the ability to process more commands at once makes the PowerPC 604e the undisputed best CPU for any personal computer. Sorry, Pentium Pro.

WINNERS • WINN

Business Productivity

FILEMAKER PRO 3.0

We loved Claris's (*http://www.claris.com*) database even before it went relational with version 3.0; now it's even more indispensable.

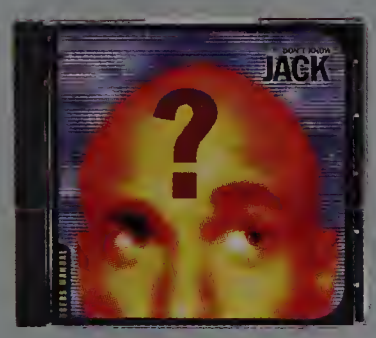
Finalists: Bravo for **Now Contact and Up-to-Date 3.6**, Now Software's (*http://www.nowsoft.com*) calendar that can download items from the Web. On the heavy-duty side of big business, a big round of applause to **Big Business 2.0** from Big Software (*http://www.bigbusiness.com*), which combines all the necessary pieces of an enterprise accounting system with the ease of a Mac.

Personal Productivity

CLARISWORKS 4.0

The Mac isn't known for its lean-and-mean applications, but this is the exception. And it's especially refreshing to discover how fast Claris's (*http://www.claris.com*) integrated office package runs.

Finalist: A banking application like Intuit's (*http://www.intuit.com*) **Quicken Deluxe 7** is like a microwave oven—once you get one, you'll wonder how you lived without it.



YOU DON'T KNOW JACK XL

Data Presentation

DELTAGRAPH 4.0

Working with Microsoft Excel, DeltaPoint's (*http://www.deltapoint.com*) application holds the answer to any graphing question you're likely to have. And, appropriate for number-crunchers, the price is right.

Finalist: Turning chaos into process is easy with flowcharts and presentations in Claris's (*http://www.claris.com*) **ClarisImpact 2.0**.

Entertainment

YOU DON'T KNOW JACK XL

Everyone who ever bombed out of *Jeopardy!* tryouts can exact revenge with Berkeley Systems' (*http://www.berksys.com*) wacky retro quiz CD, a delightful use of technology.

Finalists: If Franz Kafka were designing game CDs, Pulse Entertainment's (*http://www.badmojo.com*) **Bad Mojo** would be the eerie result. For brighter times at the old keyboard, MetaTools' **PowerGoo 1.0** is the technological equivalent of finger-painting and silly putty.

Reference

CINEMANIA 97

Even before you go to the video store, pop this guide to 20,000 films in your CD player. You can search by mood (yours) or genre (the film's). Plus you can download updated reviews from Microsoft's (*http://www.microsoft.com*) Web site.

Finalist: When it comes to electronic reference material, Microsoft's **Bookshelf 97** wrote the book. In this year's version, a zip code directory, a Web directory, and Microsoft Internet Explorer have been added.

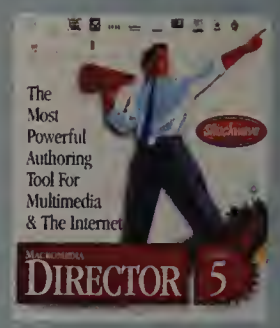
Graphics/Publishing Utilities

DEBABELIZER 1.6

For moving files from any one of 70 graphics formats to another, this utility from Equilibrium (*http://www.equilibrium.com*) is a must-have.

FREEHAND 7.0

VISTA-S6E



DIRECTOR 5.0

Scaling, cropping, and color adjustments are done at no extra charge. A service bureau's dream.

Finalist: Markzware's (*http://www.markzware.com*) **FlightCheck 2.8** is the best way to avert bad prepress dreams before they become nightmares.

Graphics Plug-Ins

SERIES 3, SCREENS FILTER 1.4

Sure it lets you erase stray dots and lines from CMYK images, but Andromeda's (*http://www.andromeda.com*) plug-in also gives a helping hand to novices and gets out of the way of experts.

Finalist: Alien Skin's (*http://www.alienskin.com*) **Stylist 1.0** picks up where Adobe Illustrator leaves off, letting you combine progressive sets of fill-and-stroke attributes. It's a heck of a productivity tool.

Illustration

FREEHAND 7.0

With the latest version of this great program, you get better gradients and blending features, and wonderfully sophisticated autotracing. Macromedia (*http://www.macromedia.com*) continues to rule the roost here.

Finalists: Adobe (*http://www.adobe.com*) **Illustrator 6.0** comes in a really close second, and it gets points for being organized and efficient so that artists can be creative. With its ability to treat complex graphics as simple objects, Fractal Design's Expression (*http://www.fractal.com*) adds new wrinkles to an established category.

Image Editing

PHOTOSHOP 4.0

Although Photoshop experts may be perturbed by the revamped look of this brand new version from Adobe (*http://www.adobe.com*), we're confident that in no time at all their opinion will be "transformed."

Finalist: When it comes to image editing, Fractal Design's (*http://www.fractal.com*) **Painter 4.0** is the palette, the easel, the atelier, and southern exposure all rolled into one.

Publishing Plug-Ins

QX-TOOLS 2.0

Extensis (*http://www.extensis.com*) figured out what extras QuarkXPress users need and put them all in this extensions package. The publishing professional may not even need everything that's there.

Finalists: And what Extensis did for QuarkXPress users it also did for Adobe PageMaker 5.0 and 6.0 users—the result is **PageTools 2.0**. When it comes to setting up tables in QuarkXPress, Npath's (*http://www.npath.com*) **Tableworks Plus** can't be beat, even by Martha Stewart.

Page Layout and Design

PAGEMAKER 6.0 AND QUARKXPRESS 3.32

Nothing's changed since last year: Adobe Systems (*http://www.adobe.com*) and Quark (*http://www.quark.com*) are still the undisputed leaders in this crucial arena for the Macintosh, despite their differences.

No finalist.

Scanners

VISTA-S6E

The view is great from here—this scanner's images and the ease in getting them will take your breath away. Best of all, this scanner from Umax Technologies (*http://www.umax.com*) has a price that's unbelievably low for the high quality you get.

No finalist.

Video-Display Cards

XCLAIM VR

This is not your everyday graphics card—this is the one that'll take you so far into virtual reality, you may never want to come back. Not only does ATI Technologies (*http://www.atitech.com*) give you fast video display at a low price, you also get accelerated 3-D playback for gaming.

No finalist.

Digital Cameras

PDC-2000

This is easy to picture—a camera from Polaroid (*http://www.polaroid.com*) that makes digital photography a snap. This company keeps pushing the envelope of photo technology.

Finalist: A low-cost but agile performer, Fujifilm's (*http://www.fujifilm.com*) **Fuji DS-7** is an excellent contender in the camera panorama.

Multimedia Authoring

DIRECTOR 5.0

What can you say about the tool of choice for professional developers—the one with painting and animation features and a scripting language—other than . . . thanks, Macromedia (*http://www.macromedia.com*).

Finalist: Presentations, CDs, and Web sites come alive with **QuarkImmedia 1.0**, an add-on to QuarkXPress that takes advantage of everything you already know about Quark (*http://www.quark.com*).

Web Authoring

BBEDIT 4.0

Only a text editor? Byte your tongue. None of the Web masters we polled can live without Bare Bones Software's (*http://www.barebones.com*) HTML editor for building their Web sites.

Finalist: For the Web aficionado needing more basic tools and the comfort of WYSIWYG, look no further than Adobe's (*http://www.adobe.com*) **PageMill 2.0**.

Video Production

AFTER EFFECTS 3.1

Until a time machine is invented, this is the only way you have to control time and motion. Adobe (*http://www.adobe.com*) has made it a breeze.

Finalist: Digital-video cards are not necessarily easy to use, nor do they always deliver the video quality promised. **Media 100's** (*http://www.media100.com*) PCI card delivers.

Audio Production

DIGITAL PERFORMER 1.71

When it comes to a digital-audio tool with built-in pitch and tempo shifting, Mark of the Unicorn (*http://www.motu.com*) is right on the mark.

Finalist: Taken over by Macromedia (*http://www.macromedia.com*)

PDC-2000

YoYo 1.5

this year, **Deck II 2.5** lets you do multitrack recording without investing in expensive audio hardware.

3-D Graphics

INFINI-D 3.5

Specular International's (*http://www.specular.com*) product combines the best of rendering and animation tools for both novice and expert applications.

Finalist: **Detailer 1.0** from Fractal Design (*http://www.fractal.com*) lets you paint directly on 3-D objects using the same natural media tools that made Painter so popular.

Developer Tools

CODEWARRIOR GOLD 10

This complete package for building applications is to Macintosh developers what Toys "Я" Us is to kids. Kudos to Metrowerks (*http://www.metrowerks.com*) for helping Macintosh applications thrive.

Finalist: Thanks to Natural Intelligence's (*http://www.roaster.com*) **Roaster DR 2.3**, developers can caffeinate Java applications on the Mac.

Technical/Engineering

DATA DESK 5.0

One of the highest-rated applications we've ever reviewed, Data Description's (*http://www.datadesk.com*) product makes data analysis easier than statistics has a right to be.

Finalist: For students pondering how to jump into statistics, Duxbury Press's (*http://www.duxbury.com*) **Jmp In 1.0** provides a comfortable diving platform.

Communication Hardware

YOYO 1.5

It doesn't look like a yo-yo or sound like a modem, but Big Island's (*http://www.big-island.com*) compact hardware and easy-to-use software are the best things that ever happened to telephony on the Macintosh.

Finalist: If your ISDN setup was a nightmare, then you didn't use Farallon's (*http://www.farallon.com*) **Netopia ISDN Modem 412**.

Network Software

NETDOUBLER 1.2

Asanté Technologies' (*http://www.asante.com*) software is the best way to speed up your network short of tearing out the whole thing and starting over with fiber. For graphics or prepress professionals shooting large files back and forth, it's a rocket.

Finalist: If you need to share files across a network or over the Internet, or troubleshoot a user's system remotely—whether it's a Mac or a PC—**Timbuktu Pro 3.0** from Farallon Communications (*http://www.farallon.com*) does the trick.

Internet Client Software

REALAUDIO 2.0

When the twenty-first–century version of Woodstock takes place solely on the Internet, the concert will begin with thanks given to Progressive Networks (*http://www.realaudio.com*) for bringing sound to the Web.

Finalists: Macromedia's (*http://www.macromedia.com*) **ShockWave** gives us the Web's version of early TV's Uncle Miltie dancing on our monitors. And while it may upset Ma Bell, VocalTec's (*http://www.vocaltec.com*) **Internet Phone 3.0** is taking Internet chat to the next level.

Internet Server Software

WEBSTAR 1.3

Quarterdeck's Web server software (*http://www.quarterdeck.com*) was an instant hit in its original incarnation as MacHTTP, putting the Mac on the map of Web serverdom.

Finalists: The two it takes to **Tango for FileMaker Pro** are the Web and the database; kudos to EveryWare Development (*http://www.everyware.com*) for bringing them together. And for a WebStar add-on, you can't beat Maxum's (*http://www.maxum.com*) **NetCloak 2.1**, a slick way to help users have the best Web experience based on which browser they're using.

Electronic Mail

EMAILER 1.0

The closest thing we have to a universal in-box, this Claris (*http://www.claris.com*) godsend gets the mail to its recipient, rather than making the recipient go get the mail.

Finalist: Its name is its description: **FirstClass 3.11** from SoftArc (*http://www.softarc.com*) combines the best of electronic mail for a departmental or corporate network.

Features editor HOWARD BALDWIN and news editor STEPHEN BEALE supervised this year's award selection.

OUTSTANDING ACHIEVEMENT

Jean Bélanger and Greg Galanos

Founders of Metrowerks, they have helped Apple through its most challenging transitions, such as making the move from the Motorola 680X0 processor to the PowerPC chip; their company continues to provide the premier compiler and support key software innovations from Apple and others.

Ellen Hancock

Apple's chief technology officer helped bring composure to Apple's frantic operating system efforts by insisting that the original Copland would never be acceptable for the common user. Thanks to her, Mac OS 8 will rely on a more harmonious melody.

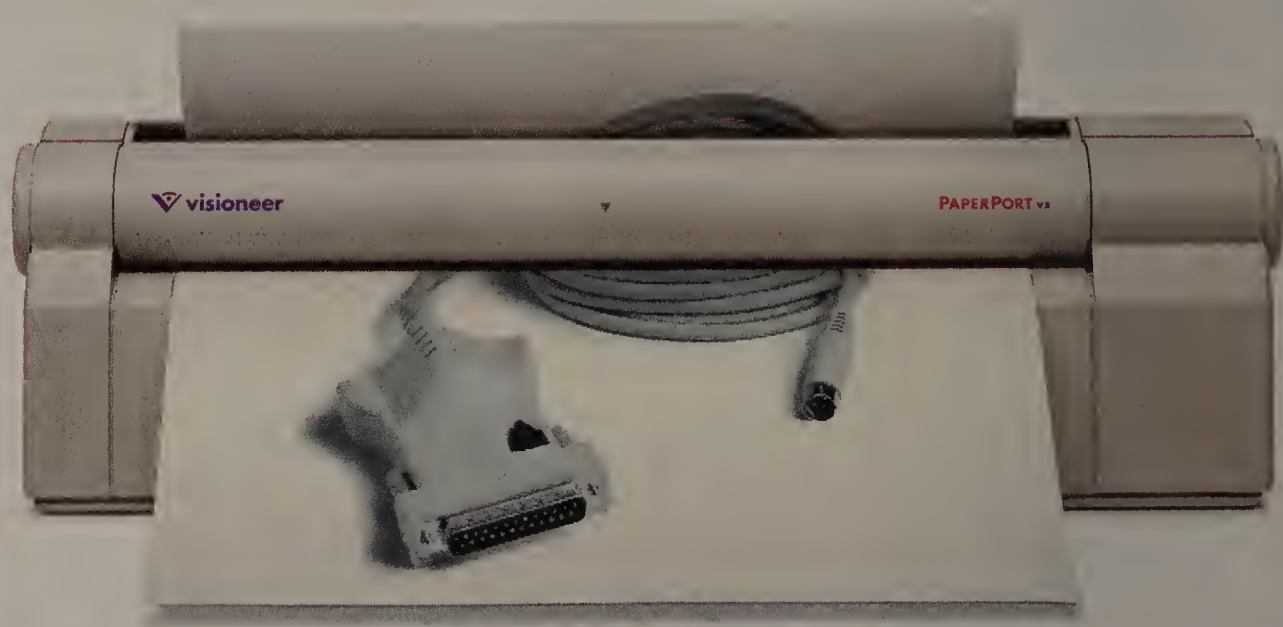
Steve Kahng

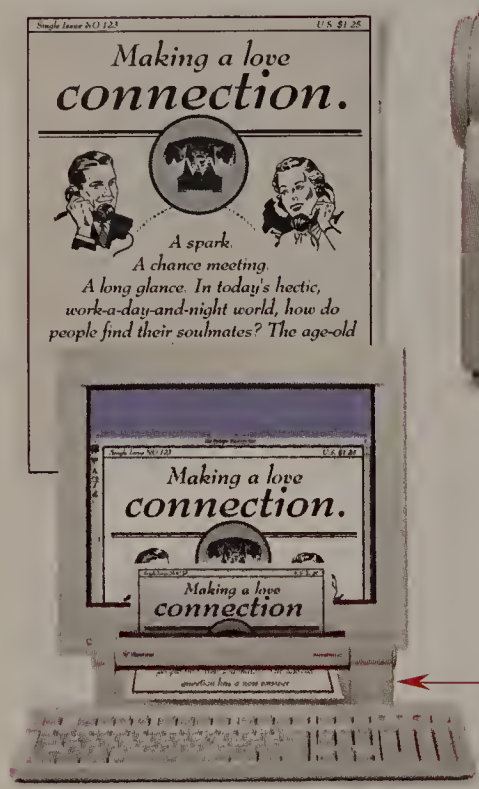
Founder of Power Computing, he breathed new life and excitement into the Macintosh market when it needed it most. And he quickly transformed a start-up company into a major player and leader on the Mac platform, validating the Mac clone industry at the same time.

visioneer

Faster-acting relief.

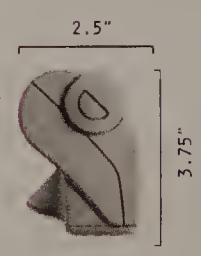
Now, PaperPort vx comes with a SCSI adapter so it's even faster at relieving organizational headaches.





PAPERPORT vx AND SCSI ADAPTER: A NATURAL CONNECTION

Connect your PaperPort vx to your SCSI port with the included SCSI adapter for Macintosh. Dealing with paper has never been faster or easier.



PAPERPORT vx MEANS YOU'LL NEVER AGAIN HAVE TO WASTE TIME RETYPING

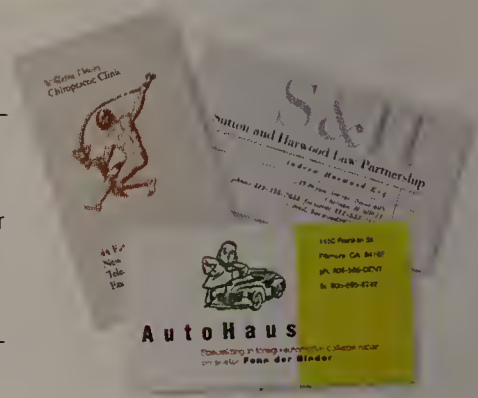
It can scan thousands of words in minutes—from virtually any type of document. Reports. Memos. Letters. Then PaperPort vx's integrated Xerox TextBridge™ OCR software converts these words to digital format so they can be edited or copied.

PAPERPORT vx FITS EASILY INTO YOUR MAC SYSTEM

It's sleek and small. It rests right between your keyboard and monitor.

PAPERPORT vx GETS RID OF CLUTTER

Then there are all of those newspaper articles, financial statements, meeting notes, and Dear Binky columns you just can't bear to part with. You can use PaperPort to scan paper as long as 30 inches, and photos in up to 256 shades of gray. So you can save them forever, and get rid of the originals—with no remorse.

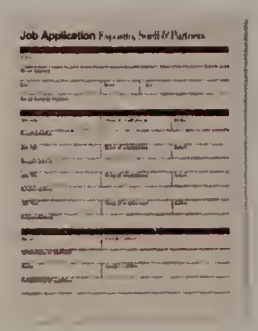


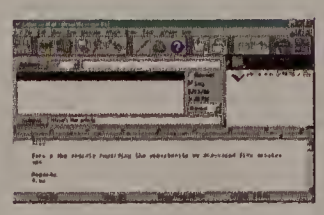
PAPERPORT vx KEEPS TRACK OF YOUR CONTACTS

Tired of forgetting people's names and numbers? Just scan business cards into PaperPort, and create a file of your business contacts—all on your Macintosh computer.

NEW. PAPERPORT vx CONQUERS THE COMMON FORM

Forms. If they're the bane of your existence, buy Visioneer's FormTyper™ software. Like magic, it brings up forms on your computer and finds all the fields you need to fill out. All you have to do is tab from field to field, and type. (FormTyper is sold separately and is available directly from Visioneer at http://www.visioneer.com).





PAPERPORT vx PUTS POWER BEHIND YOUR E-MAIL

Find a good tidbit about a competitor in the Sunday paper? Scan it into PaperPort and send it off to your colleagues using e-mail, so they can use the data to close the big deal on Monday morning.

PAPERPORT vx IN THREE EASY STEPS

1. Feed in a document. In as quick as 6 seconds, it's scanned.
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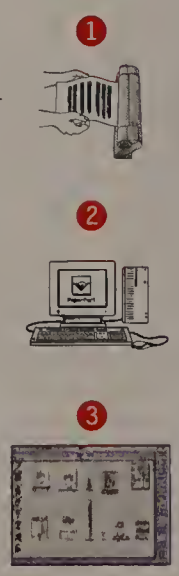
3. Edit, copy, print, e-mail, fax, file, or organize the material as necessary.



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MW LAB

Scanning for the Rest of Us

EVERYONE CAN NOW OWN A QUALITY COLOR SCANNER—THANKS TO PLUMMETING PRICES

KEVIN CANDLAND

BY JOSEPH SCHORR

Because of their $1500-and-up price tags, color flatbed scanners used to be the exclusive domain of graphics professionals. Now that street prices have plummeted below $400, just about anyone can justify buying a scanner to feed photographs, line art, or pages of text into a Mac.

But just what kind of results can you expect from a budget-priced scanner, one that costs hundreds—or thousands—of dollars *less* than many of the more sophisticated models available? To find out, Macworld Lab tested 15 entry-level color scanners, nearly all with street prices under $600. We evaluated the scanners for color fidelity, gray-scale sensitivity, signal distortion (noise), and speed to find out which scanners provide the best springboard into the world of desktop image editing.

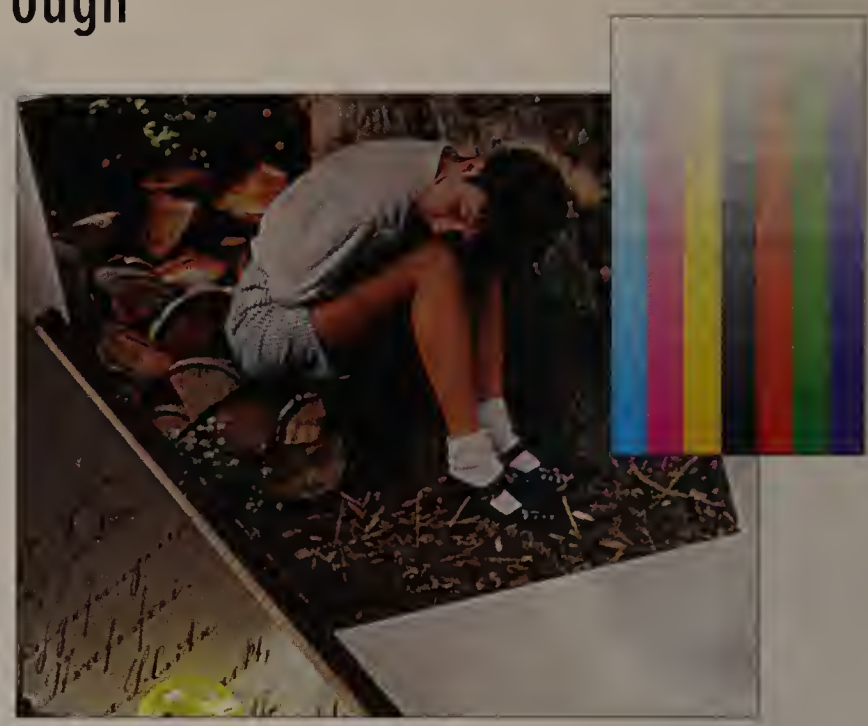
Great for Web Graphics

Make no mistake: when it comes to color fidelity and image quality, none of these scanners compare to expensive drum scanners or even to higher-end flatbed scanners (which can cost tens of thousands of dollars). The optics used in these low-cost models tend to blur and distort fine details, especially when you scale images by more than 200 percent. As a result, these models aren't up to such tasks as scanning 35mm slides, which generally have to be scaled quite a bit, or producing images for high-end professional color publishing.

But these scanners are ideal for creating Web graphics, which generally are small and don't require a resolution above 72 dpi, and for typical OCR tasks, such as digitizing printed documents and converting them to editable text. They also produce good results for less-demanding ventures: newsletters, school reports, and such.

True Colors Don't Always Shine Through

EVEN THE BEST OF THE LOW-BUDGET SCANNERS WE TESTED HAD trouble in our color-fidelity tests, especially in reproducing dark and medium colors. Both of the output samples shown here, from the highly rated Umax Vista-S6E and the disappointing Microtek ScanMaker E3, illustrate the blurring and loss of detail you can expect from scanners of this caliber (the goal is to match the Crosfield scan at far left). The Vista-S6E, however, offers much better color fidelity, particularly on lighter colors. On the other hand, the ScanMaker E3 couldn't even come close to matching the colors of the original image, producing lifeless, washed-out light tones and undersaturated dark tones. Of the 15 scanners we tested, the ScanMaker E3 received the lowest scores on skin and earth tones.



Crosfield

Interpreting Interpolation and Resolution

The scanners we tested have an optical resolution of either 300 or 600 dots per inch, meaning that there are 300 or 600 sensors (called CCDs, or charge-coupled devices) lined up on each inch of the scan head. Most scanning vendors claim their units offer an *interpolated* resolution of 2400 dpi, 4800 dpi, or higher. Don't pay much attention to that claim. Interpolation is a mathematical calculation performed by the scanning software that increases the apparent resolution of the final image, smoothing out lines that might otherwise appear jagged. Software interpolation may improve the quality of line-art scans, especially those scaled at more than 100 percent, but otherwise it's the true optical resolution of the scanner that really matters.

The 600-dpi models cost more than the 300-dpi scanners, but don't assume you need a 600-dpi scanner to get the best results. If you're creating a batch of 72-dpi graphics for your Web page, for example, scans created at 600 dpi won't look better; they'll just be bigger files. Likewise, if you plan to print your work on a 600-dpi monochrome laser printer, images of more than 300 dpi won't improve the quality of the halftones—they'll just slow down your print job.

Virtually all the scanners we evaluated come with scanning software—either a stand-alone program or a plug-in to Adobe Photoshop—and a SCSI cable. Most also come with a more full-blown image-editing package, such as Photoshop LE (a version without all the program's features) or a full version of MicroFrontier Color It. Some include OCR software as well. All the scanners but the La Cie SilverScanner Pro (*http://www.lacie.com*), Hewlett-Packard ScanJet 4p (*http://www.hp.com*), and Info ImageReader Elite (*http://www.infoconnection.com*) support an optional transparency unit to scan 35mm slides. These add-ons range in price from $199 to $695. (See the table, "Low-Cost Scanners: Features in Focus," for further details.)

Image Quality Revealed

In terms of color fidelity, the ScanJet 4p produced the truest color, scoring considerably higher than all the other scanners. (Unfortunately, the ScanJet didn't excel in *any* of our other tests.) The other outstanding performers were also 300-dpi scanners—the Nikon ScanTouch 110 (*http://www.nikonusa.com*) and Umax Technologies Vista-S6E (*http://www.umax.com*). (In this roundup, the ScanJet 4p earned a rating of

The Speed of Scanning

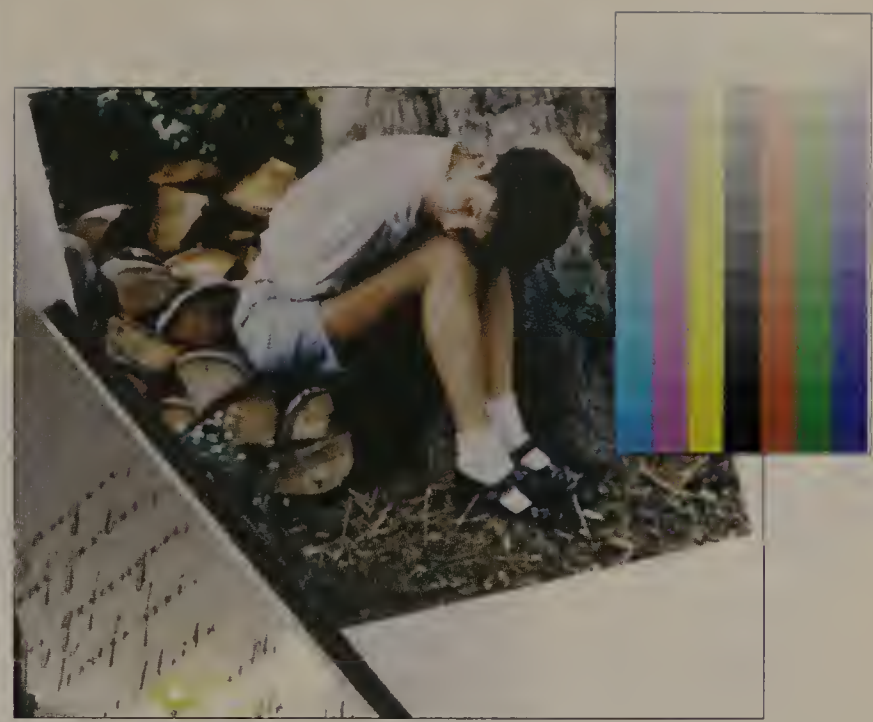
To test a scanner's speed, Macworld Lab measured both the prescan and final scan times for an 8-by-10-inch color image and a similar-size gray-scale image, each scanned at 300-dpi resolution. All scanners were tested using default settings. Also, we allocated 30MB to Adobe Photoshop when a scanner used a Photoshop plug-in as its interface, and 30MB to the scanner applications themselves; this prevents disk access (performance of the hard drive) from inadvertently influencing the scanner speeds.

Best result in test. Shorter bars are better. Products are listed alphabetically. Times are in seconds.

	GRAY-SCALE SCAN		COLOR SCAN	
	Preview Time	Scan Time	Preview Time	Scan Time
Agfa SnapScan	7.3	32.6	11.4	82.4
Apple Color OneScanner	18.1	40.5	17.7	37.7
Hewlett-Packard ScanJet 4p	15.3	29.2	15.6	94.6
Info ImageReader Elite	26.2	41.4	26.1	334.7
Info ImageReader FB	73.5	36.9	74.5	148.7
La Cie SilverScanner Pro	9.2	43.9	17.5	126.9
Microtek ScanMaker E3	23.8	21.9	24.0	61.9
Microtek ScanMaker E6	25.3	35.4	25.4	110.2
Nikon ScanTouch 110	10.4	15.7	15.7	49.0
Nikon ScanTouch 210	18.9	29.0	20.8	42.8
PIE ScanAce II	29.9	23.4	38.3	75.6
Tamarack ArtiScan Z1-600	29.5	56.1	70.5	109.2
Tamarack ArtiScan Z1-1200	31.8	56.2	73.8	111.5
Umax Vista-S6E	13.0	17.7	15.7	45.0
Umax Vista-S12E	17.0	27.4	18.4	35.6

Behind Our Tests All tests were performed on a Macintosh 7500/100 with 64MB of RAM, System 7.5.5, and a 17-inch Apple Multisync monitor set to 24-bit mode. We used the Mac's 256K L2 cache; disk cache was set to 1024K; virtual memory and RAM disk were disabled; and AppleTalk was enabled.—**Macworld Lab testing supervised by Jeff Sacilotto and Chris Uiterwijk**

Umax Vista-S6E



Microtek ScanMaker E3

★★/4.9, down from *Macworld*'s previous rating of ★★★/6.3. At the time we gave the ScanJet 4p the higher rating, the scanner's price was more competitive. We've downgraded the rating because the 4p hasn't kept pace with other scanners in terms of price and performance.)

As a rule, 300-dpi scanners don't usually produce better images than 600-dpi models. But in our image-quality results, many 300-dpi devices bested their 600-dpi counterparts. Why? It's possible that the particular 600-dpi scanners we tested in this low price range simply weren't constructed as well as the 300-dpi units. The weaker performance of the 600-dpi scanners shows that the *quality* of the scanner's optics and the scanning software are what's most important, not the raw resolution.

It's worth noting that the specific settings used had a tremendous impact on the results. Most scanning software packages offer an automatic scanning mode: you click on the automatic button and let the scanner handle color balance, contrast, and so on.

But in almost every case, we got better results by turning the automated features *off*. The PIE ScanAce II (*http://www.scanmedia.com*), for example, finished second on the list with the auto setting turned off but ended up toward the bottom with it on. Automatic settings are fine for quick-and-dirty scans, but they generally can't account for the nuances of color, contrast, and brightness peculiar to each image you scan. (An exception is the Vista-S6E,

MW LAB

Bright Color, Soft Noise

A scanner that can perfectly re-create an original image's colors is the ideal—and nearly impossible to find, particularly in the $600-and-under price range. The Color Fidelity numbers below reflect each scanner's variation from the ideal. The lower the number, the less variation; a score of zero would be perfect (though impossible). Overall, Hewlett-Packard's ScanJet 4p fared the best in color fidelity; the two scanners from Microtek produced the worst color fidelity. As for noise, smaller scores are best, as they indicate the scanners that produced the least amount of visual distortion. Noise can be a problem if you are scanning an image with small details or if you plan to modify the levels or curves of an image to any extent. The La Cie SilverScanner Pro came out tops in our noise tests; the two bottom-dwelling Tamarack scanners had the most noise.

Best result in tests. Shorter bars are better; 0.0 is the theoretical (but unattainable) perfect score. Products are listed alphabetically.

	Color Fidelity				Noise
	Dark Colors	Light Colors	Primary Colors	Skin and Earth Tones	Mean
Agfa SnapScan	11.7	3.3	6.6	6.5	1.3
Apple Color OneScanner	7.5	6.4	7.4	7.5	1.5
Hewlett-Packard ScanJet 4p	3.8	3.0	3.8	4.3	1.7
Info ImageReader Elite	6.9	4.0	6.0	6.4	1.3
Info ImageReader F8	12.2	3.0	5.6	7.8	1.1
La Cie SilverScanner Pro	8.9	4.1	5.3	6.7	0.7
Microtek ScanMaker E3	12.8	8.7	10.5	12.1	1.6
Microtek ScanMaker E6	13.2	8.9	10.6	11.9	1.3
Nikon ScanTouch 110	5.8	3.4	5.6	5.3	1.1
Nikon ScanTouch 210	11.8	3.0	7.0	8.3	1.1
PIE ScanAce II	5.3	4.1	4.8	4.6	1.5
Tamarack ArtiScan Z1-600	6.8	3.6	5.8	6.6	1.8
Tamarack ArtiScan Z1-1200	8.5	4.0	6.8	8.5	2.3
Umax Vista-S6E	6.9	2.9	5.5	6.1	0.9
Umax Vista-S12E	6.3	4.4	6.4	6.0	0.8

Behind Our Tests

To test for color fidelity, we scanned the industry-standard color-calibration tool, an IT8 swatch, which contains 264 patches of carefully selected colors. Next, we measured each patch with the Lightsource Colortron II Spectrophotometer, then calculated the RGB values using Spectrum Analysts' IP Lab software. Finally, we compared the RGB data with the spectral data to see how far each scanner deviated from the original color values.

To measure noise, we scanned a target image three times at five-minute intervals. The resulting images were then compared in Adobe Photoshop using the difference calculation, yielding a new file. From the histogram of the new file we extracted the mean. A perfect scanner would introduce no noise and receive, theoretically, a score of zero.—**Macworld Lab testing supervised by Jeff Sacilotto and Chris Uiterwijk**

Low-Cost Scanners: Features in Focus

Company Price	Product	Star Rating *	List Price/ Company's Estimated Price **	Phone	Optical Resolution (in dots per inch)/ Bit Depth	Transparency Adapter Price/ Sheet Feeder
Agfa	SnapScan	★★★/6.9	NP/$389	508/658-5600	300/24	$399/$399
Apple Computer	Color OneScanner 600/27	★★★/5.1	NP/$549	408/996-1010	300/27	NA/$449
Hewlett-Packard	ScanJet 4p	★★/4.9	$615/$499	208/323-2551	300/24	NA/$559
Info	ImageReader Elite	★★/3.8	$399/$349	408/538-2500	300/24	NA/NA
	ImageReader FB	★★/3.8	$549/$499	408/538-2500	600/30	$199/$299
	Editors' Choice					
La Cie	SilverScanner Pro	★★★★/7.1	$499 ***/NP	503/520-9000	300/24	NA/NA
Microtek Lab	ScanMaker E3	★★/3.8	NP/$329	310/297-5000	300/24	$299/$400
	ScanMaker E6	★★/3.7	NP/$599	310/297-5000	600/30	$299/$400
Nikon Electronic Imaging	ScanTouch 110	★★★/5.9	NP/$299	516/547-4355	300/24	$695/$499
	ScanTouch 210	★★★/5.3	NP/$699	516/547-4355	600/24	$695/$499
PacificImage Electronics (PIE)	ScanAce II	★★/3.8	$899/$599	310/214-5281	600/30	$475/$475
Tamarack Technologies	ArtiScan Z1-600	★★/3.7	$499/$279	714/744-3979	300/30	$499/$499
	ArtiScan Z1-1200	★★/3.3	$699/$449	714/744-3979	600/30	$499/$499
	Editors' Choice					
Umax Technologies	Vista-S6E	★★★★/8.4	NP/$345	510/651-4000	300/24	$399/$399
	Vista-S12E	★★★/6.6	$649 /$499 ***	510/651-4000	600/24	$399/$399

*NA = not available; NP = not provided. * Based on features, implementation, innovation, performance, reliability, ease of use, and value. (See Star Ratings section for full explanation.)*

*** Actual price could be higher or lower than the estimated street price provided by the company. *** $599 with Adobe Photoshop LE.*

which actually produced better color with the automatic setting turned on.) For our final measurements, we used whatever settings produced the best results.

Avoid the Noise

Scanner noise is the image distortion caused by electrical interference or fluctuation in the scanner's light source. Too much noise degrades the quality of your images, especially if they contain a lot of detail or require much sharpening.

The quietest, most distortion-free scanners were the sleek La Cie SilverScanner Pro and the two Umax models, the 300-dpi Vista-S6E and the 600-dpi Vista-S12E. The HP ScanJet 4p, which performed so well in the color-fidelity test, bombed out on noise, finishing near the bottom of the heap. Other noisy scanners included Microtek Lab's ScanMaker E3 (*http://www.microtekusa.com*), the PIE ScanAce II, and the Apple Color OneScanner 600/27 (*http://www.apple.com*).

Finally, speeds among these scanners varied widely. For example, the Info ImageReader Elite, one of the slowest scanners we tested, took more than seven times longer than the zippy Umax Vista-S6E to complete a color scan. On average, the fastest units were the Nikon ScanTouch 110, Umax Vista-S6E, and Agfa SnapScan (*http://www.agfa.com*). The slowest scanners—ones to avoid, especially if you plan to perform a large number of scans—are the painfully sluggish Tamarack (*http:www.tamaracktechnologies.com*) and Info scanners.

The Last Word

Most of the scanners we looked at offered middle-of-the-road performance at best. The good news, though, is that the overall best model we tested, the Umax Vista-S6E, is also among the least expensive. The S6E finished near the top in almost every one of our quality tests and scored well in our color-fidelity and noise tests. It's also one of the fastest scanners we evaluated—and it costs just $345.

Also worthy of recommendation is the La Cie SilverScanner Pro. Although it costs a bit more ($499 list), the La Cie rendered the images with the least noise, finished second in the gray-scale speed tests, and offered some of the clearest images we saw. In addition, it is pleasingly compact and has a convenient front-mounted power button. It also comes with good scanning software and a well-written manual. m

Contributing editor JOSEPH SCHORR is coauthor of the just-released *Macworld Mac Secrets*, fourth edition (IDG Books Worldwide, 1997).

COLOR SCANNERS

A bargain-priced scanner is no bargain if it can't deliver reliable, crisp images. We tested each scanner for color accuracy, resolution, and speed to find those with both low cost and high quality.

★★★★/7.1 **SilverScanner Pro** The sleek, compact SilverScanner Pro, although not a speed demon, produced high-quality scans. It comes with excellent, easy-to-use scanning software and great documentation. **Company:** La Cie (503/520-9000, *http://www.lacie.com*). **List price:** $499.

★★★★/8.4 **Vista-S6E** One of the least expensive scanners in our roundup, the Vista-S6E outperformed scanners costing nearly twice as much. Its color fidelity, low noise output, and speedy performance make it tops among budget scanners. **Company:** Umax Technologies (510/651-4000, *http://www.umax.com*). **Company's estimated price:** $345.

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Secrets

The Finder Revisited

LITTLE-KNOWN SHORTCUTS THAT EVEN THE EXPERTS FORGET TO USE

by Joseph Schorr

Most of the tips, tricks, and shortcuts associated with the Macintosh Operating System can't really be considered secrets anymore. All but the most inexperienced Macintosh users know, for example, that you can select a file in a Finder window by typing its name or that you can close all the windows on your screen at once by holding down the option key and pressing ⌘-W. It's time to stop calling those *secrets*.

But here is a collection of alluring, oddball tricks that even many experienced Macintosh users don't know—or have forgotten about. Take a look. How many of these labor-reducing, time-saving, secret little gems can you adopt into your personal arsenal of Macintosh OS shortcuts?

Upward Mobility

Suppose that you are looking at a series of nested folders in an expanded outline view in the Finder, as shown in "Moving Up the Hierarchy." You want to drag a file that lies buried inside one of the nested folders upward so that it ends up in the *outermost* window—the window you actually have open.

This little maneuver is trickier than it seems. It's easy to drag a file in an outline view into another *folder* in the outline, but how do you move a file out of *all* the folders in the outline view and into the window's root level? Dragging the file into an open part of the window area doesn't work; the file just snaps right back to its original location because the Mac doesn't understand where you want to put the file. You can actually *open* the folder containing the file, then drag that file back to the window where you want it. Or you can drag the file out onto the desktop and then back to the window. But both of these options are too much work.

The secret? Drag the file to the *header* of the window—just below the title bar. The file moves directly to the level of the window, not to a folder within the window.

Be Selective

Here's another list-view shortcut. Everyone knows you can select a group of files in a list view by dragging over them. But few realize that you don't have to drag over the *names* of the files—you can drag over *any* of the text in the Size, Kind,

continues

Label, or Last Modified columns to select files. The text in the list columns doesn't get highlighted—just the names of the files do—but the corresponding files will be selected all the same (see "Make a Selection").

This little trick is great for selecting a set of files based on specific information displayed in list views. To select just the files created during the month of March, for example, you can sort the list view by date (by clicking on the Last Modified header) and then drag over the March dates; there's no need to scroll over to look at the names of the files. This allows you to select a specific subset of files based on list-view information, even when you're working in a narrower window.

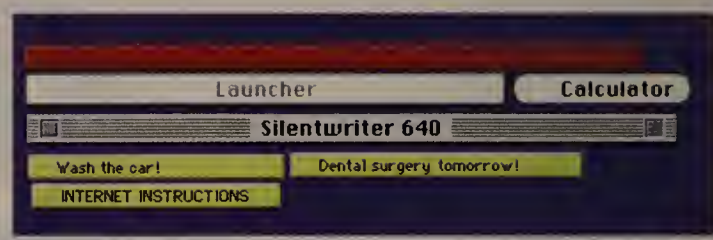
The Mouseless Chooser

With desktop printing, the LaserWriter 8.4 driver, and the Control Strip on the scene, there are fewer and fewer reasons to visit the Chooser (see *Secrets*, January 1996). But if you must spend time there, for heaven's sake use the Chooser's hidden keyboard shortcuts.

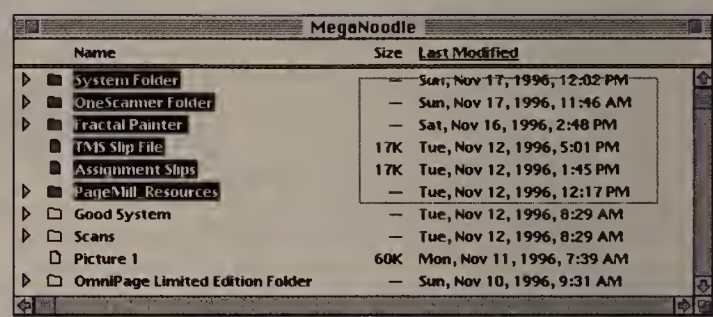
As soon as the Chooser is open, type the first letter of a device driver to select it—to connect to a server, for example, type **A** for AppleShare. In most cases, you type the first few letters to select a name. If you have to type too many letters to get the name, type just the first letter to get near the right choice, then tap the up or down arrow keys to pick the name you want. At most, it's only one or two additional key presses.

To pick a laser printer, type **L** for LaserWriter 8, and so on. Next, press tab to select the Zone field (if you are connected to a network that has more than one zone) and type the first letter of the zone you want to connect to. Pressing tab again moves you to the right-hand field, where you can choose a specific printer or file server. Again, simply typing the first letter or two of a device's name selects it (the up and down arrow keys can also move you through the list). Finally, press ⌘-W or ⌘-Q to close the Chooser.

Using this technique, you can reduce unavoidable trips to the Chooser to just a few keystrokes. To select a laser printer called Clarence in the zone called Editorial, for example, you would type **L**, tab, **E**, tab, **C**, ⌘-Q.



Pull the Shades Here are a few of the items that can be collapsed into space-saving title bars with the WindowShade control panel: the Calculator, Stickies, Note Pad, and AppleCD Audio Player.

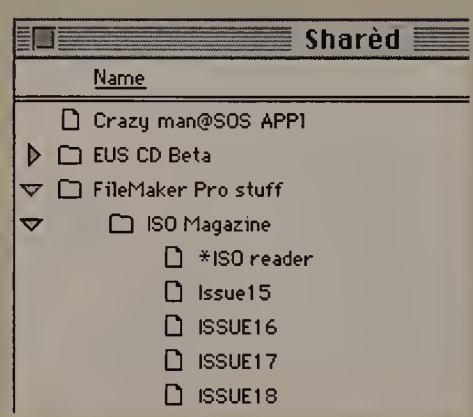


Make a Selection You can drag over any part of a list view in a Finder window to make a selection. In this example, dragging over the Last Modified and Size fields selects the file names.

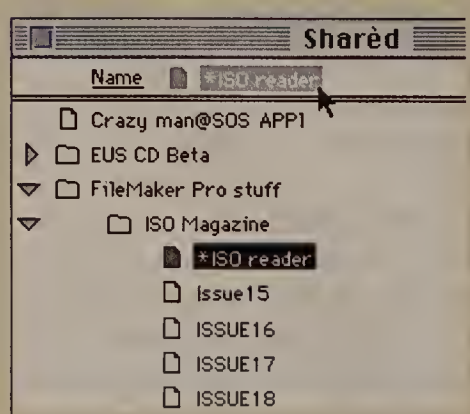
Moving Up the Hierarchy

HOW DO YOU MOVE A DEEPLY NESTED ITEM—SUCH AS THE FILE CALLED *ISO READER—UP TO THE LEVEL OF THE WINDOW THAT ENCLOSES THE WHOLE OUTLINE VIEW, WITHOUT FIRST DRAGGING THE FILE TO THE DESKTOP?

Select the file (1) and drag it up to the header at the top of the window (2)—anyplace above the double line will do. Then drop the file in the header area. Voilà! The file is no longer nested, it's just sitting in plain view on the first level of the open window (3).



1



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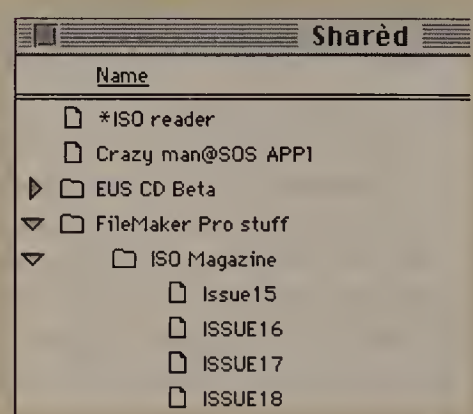


3

D Stands for Don't

When you try to close an unsaved file in most programs, you frequently get a dialog box with three options: Save, Don't Save, and Cancel. Generally, you can press return to save the file and ⌘-period (or escape) to cancel the dialog box and return to your document—but what if you really *don't* want to save the document? Usually you have to click on the Don't Save button manually.

But not always. In SimpleText, for example, you can activate the Don't Save button by pressing the D key. In Stickies, you can close an unsaved note by pressing ⌘-D. The same keystroke works in ClarisWorks 4.0. Sure, it's just a little thing, but little things can add up—to a faster and more efficient Mac. **m**

Contributing editor JOSEPH SCHORR is coauthor of the newly released *Macworld Mac Secrets*, fourth edition (IDG Books Worldwide, 1997).

Quick Tips

Tips, Tricks, and Shortcuts

by Lon Poole

Everyone knows you can use Netscape Navigator to read documents or download files from FTP sites. A few people have probably noticed that if you use Navigator to access an anonymous FTP site whose directory grants write privileges (lets you save files), you can choose Upload File from Navigator's File menu. Simon Szykman of Gaithersburg, Maryland, figures most people don't know they can use Navigator to upload to and download from nonanonymous FTP sites—no need for a separate FTP program.

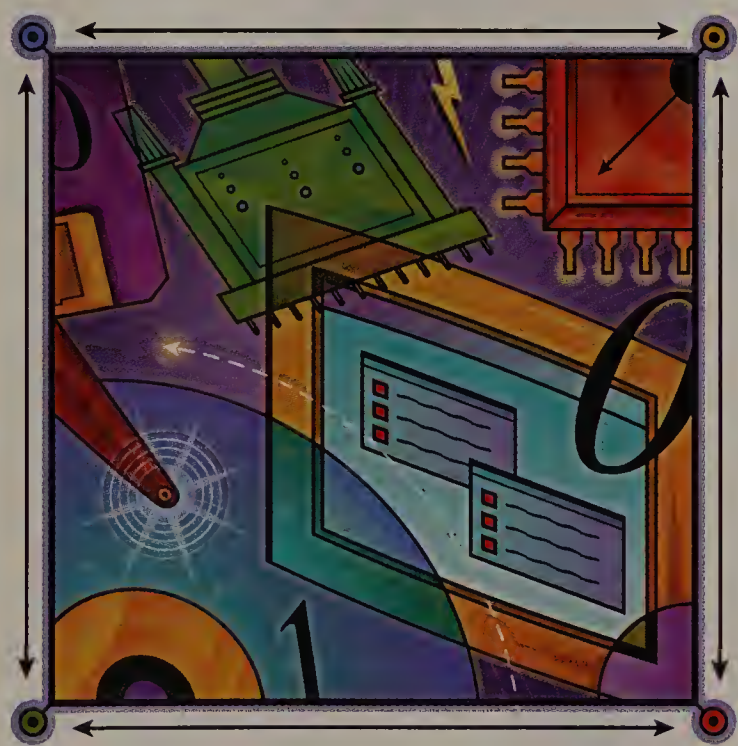
If you enter an URL of the form *ftp://username@something.somewhere.com/* (where *username* is a valid user account name for the site), the site requests a password. After entering the correct password, you will be able to transfer files and follow links to other directories to which you have access. If you know the path to a directory, you can include it at the end of the URL and end up squarely in that directory. In some cases, an FTP site with very limited access may require that you include the full directory path. You may not be allowed access to other directories at that site. As with any URL, you can add links to restricted FTP sites to your Bookmark menu or put links to them on your Web pages.

A final note for completeness: you can include the password in an URL using *ftp://username:password@something.somewhere.com/path*. Don't do it unless you have exclusive use of your computer and leaving passwords lying around does not bother you. Including the password is extremely insecure. Remember that the URL goes into the browser's history file, so somebody using Navigator after you or who has access to your Mac via a network may come across the URL with your password in it. You are far better advised just to let Navigator prompt you for it.

Stuck at the Start-up Gate

Q. My LC 575 won't start up from the internal hard drive. I can start up from a Disk Tools disk, but a message says the hard drive is damaged. How can I get my data off the hard drive?

DEREK BUMP
Waupun, Wisconsin



A. It sounds like the directory files on your hard drive are damaged. A disk's directory contains the information that tells the Mac OS where files are located on the disk. Depending on the severity of the problem, you may be able to verify the disk's directory and repair some kinds of damage with Apple's Disk First Aid program, which Apple includes on a standard Disk Tools floppy. If you had a newer Mac, you might need to start up from the CD-ROM that came with the computer instead of a Disk Tools floppy. To start up from a CD-ROM that has a System Folder, try pressing the C key during start-up. If that doesn't work, press ⌘-shift-option-delete during start-up and the Mac will ignore the primary internal drive and try to start up from the next internal drive (the CD-ROM).

You can also try zapping your Mac's PRAM (parameter RAM, which stores important system settings while the power is off). To zap the PRAM with any version of System 7, hold down the ⌘-option-P-R keys during start-up, and wait until your Mac beeps and restarts itself. Then release the keys and let the start-up proceed normally. If this works, check your control panels for options that might have been returned to their factory settings.

If Disk First Aid and zapping the PRAM don't fix the disk, you can move on to Norton Disk Doctor, which is part of Norton Utilities for Macintosh, from Symantec (541/334-6054, *http://www.symantec.com*). Norton Disk Doctor can repair some kinds of directory problems that Disk First Aid can't and may be able to recover some files even if it can't repair the directory. Follow the instructions in the Disk Doctor manual for repairing a disk and, if necessary, for recovering files with Unerase.

If none of these restoratives work, it's time to pull out the backup that you've been conscientiously keeping safe and up-to-date (right?), and restore from the backup after reformatting the hard drive with Apple's HD SC Setup program, which is also on the Disk Tools floppy. If you were formatting a Power Mac's hard

continues

Making Background Artwork a Transparent Layer

When you need to convert monochrome background art or type to a transparent layer in Adobe Photoshop 3, you can make the background layer into a transparent layer and delete everything around the art or type. But that technique works only if the art has hard edges, notes David Candland of Carnation, Washington, because deleting around antialiased art usually leaves a fringe or halo around the art. Sure, you can try to erase the fringe, or use one of Photoshop's Matting commands to clean it up, but doing so will reduce the art's integrity.

Candland's technique for flawless conversion from antialiased background art to antialiased transparent art is:

1. With the source image open in Photoshop, change the background layer into a transparent layer by double-clicking it in the Layers palette and clicking OK in the Make Layer dialog box that appears.

2. Add a mask by choosing Add Layer Mask from the pop-up Layers palette menu. You now have a temporary alpha channel associated with that layer.

3. Select the entire image, copy it, and paste it into the layer mask. If your art appears to be cut out of the background, use the Invert command or bring up the Layer Mask Options dialog box and select the alternate Color Indicates option.

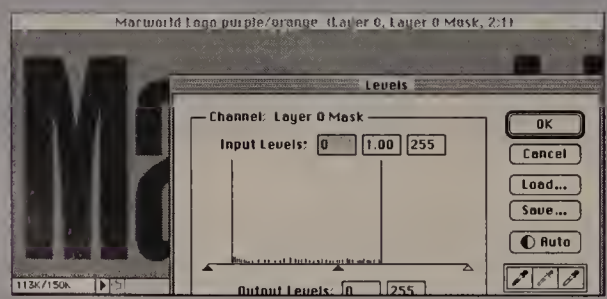
4. If the image is not black and white, you need to adjust the layer mask's tonal range. First, make the mask the only thing visible by option-clicking the mask in the Layers palette. Next, choose the Levels command, and in its dialog box select the black eyedropper and click the darkest part of the mask to make it 100 percent black. Select the white eyedropper in the Levels dialog box and click the lightest part of the mask to make it white. Now play with the middle Input Levels slider in the Levels dialog box until the antialiasing along the edges looks right. Since you're translating from monochrome to high-contrast gray scale, you have to make an eyeball judgement. Your mask is now ready. Option-click the art thumbnail in the Layers palette to make it visible.

5. At this point, the layer mask is making everything that is pure black show through 100 percent, but the midrange grays in the antialiased edges are only showing through around 50 percent. To truly maintain the integrity of the art, select the whole image (not the layer mask) and fill it with 100 percent black or fill the layer with a color. You now have a transparent background with art that maintains integrity with the original. To make mask effects permanent, choose Remove Layer Mask from the pop-up Layers palette menu and click the Apply button in the dialog box that appears.

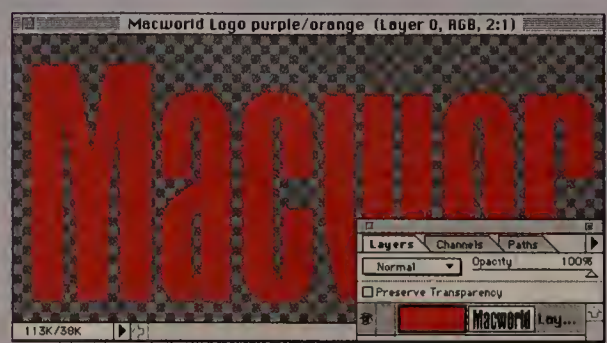
1

2

3



4



5

drive or the internal IDE hard drive on a Mac, you would use Apple's Drive Setup program (except that to format a PowerBook 150's IDE hard drive you must use the Internal HD Format utility that came with the computer). You can also format a hard drive with a third-party utility such as Hard Disk ToolKit from FWB (415/463-3500, *http://www.fwb.com*; see *Reviews*, *Macworld*, December 1996) or SCSI Director Pro from Transoft (805/897-3350, *http://www.transnet.net/transoft/*; see *Reviews*, February 1996).

If you'd like more explanation of the topics I've discussed here, I recommend Ted Landau's excellent book *Sad Macs, Bombs, and Other Disasters*, second edition (Addison-Wesley, 1995), and his MacFixIt Web site (*http://www.macfixit.com*).

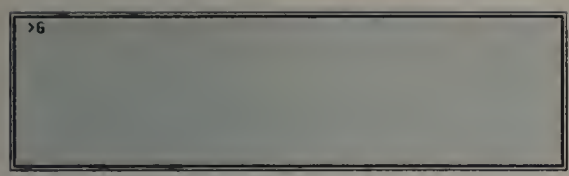
An alternative to attempting the hard drive recovery yourself is to send your computer to DriveSavers Data Recovery (415/883-4232, *http://www.drivesavers.com*) or another such company (for tips on how to choose and use a data recovery company, see *Conspicuous Consumer*, November 1995).

Mystery of the Empty Window

Q. I have noticed with my Performa 6214CD that pressing ⌘-power brings up a window that contains only a greater-than symbol (>). Any idea what it is supposed to be used for and how to get rid of it, other than performing the three-finger salute (⌘-control-power) to restart the system?

SCOTT MCCONNELL
Marion, Iowa

A. You have inadvertently discovered the mysterious programmer's window, which provides access to a limited set of program-debugging commands known as the Mini Debugger (see "Programmer's Window"). To exit the programmer's window gracefully, type **G** and press return. Over the years, people have suggested other things to type into the programmer's window to recover from a crash, but they rarely work. For instance, after a crash, pressing ⌘-power and typing **G Finder** may, if you're lucky, get you back to the Finder about as safely as an emergency quit (pressing ⌘-option-escape)—and I may win the lottery and stop writing this column. Still, if you don't play, you can't win.



Programmer's Window If you accidentally bring up the programmer's window by pressing ⌘-power (or by pressing the interrupt button on an older Mac that has one), you can usually resume work where you left off by typing G (short for Go) and pressing return. Don't type anything else unless you know what you're doing; typing the wrong thing can crash your Mac.

Bad Disk Icon

Q. For some reason, my hard drive icon now appears as a document icon. I rebuilt the desktop and tried to paste another icon in the hard drive's Get Info window, but got a message saying the command could not be completed because it could not be found. What can I do to get back my hard drive icon?

FRANCISCO DE JESUS LOPEZ
Guadalajara, Jalisco, Mexico

A. If you have problems with a custom disk icon, try the freeware utility Disk Rejuvenator from Aladdin Systems (available from Macworld Online)—also handy if you have a problem accessing your hard disk from standard Open dialog boxes. If you have problems with a custom folder icon, drag the folder's contents to a new folder and then drag the troublesome, now-empty folder to the Trash.

A New Switcheroo

TIP I was tinkering around with RAM Doubler 2 the other day and stumbled across this cool little trick. With the RAM Doubler 2 control panel showing its Application Monitor, double-click any application listed, and the control panel takes you to the application. It's like selecting it via the Application menu, only better.

DANIEL DECKER
Batesville, Arizona

Delete All Quark Guides

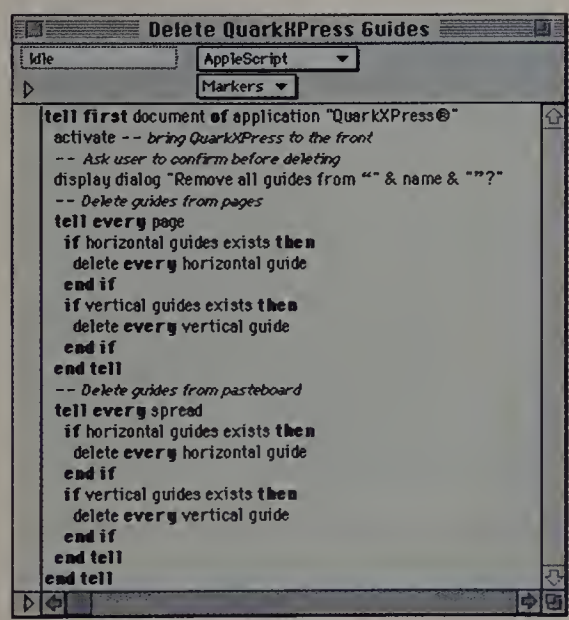
TIP Guides are great, but that doesn't mean you want them around forever. In QuarkXPress, you can delete all guides in a document by scrolling so the horizontal and vertical rulers "touch" a page, option-clicking each ruler where it touches the page (to delete the guides on that page), option-clicking again where the rulers touch the pasteboard (to delete the guides that extend across the page onto the pasteboard), and repeating for every page. It's easier to run the AppleScript shown in "No More Guides."

BOB KIM
San Diego, California

Multiple Launchers

TIP Using more than one Launcher Items folder, as suggested in *Secrets*, December 1996, takes way too much time for me. While fiddling with ResEdit I discovered that the name of the Launcher Items folder is kept in a Launcher STR# resource. Making more than one Launcher run simultaneously is pretty easy after you know that little secret. You make a copy of the Launcher, use ResEdit to open the copy, and change the first item of STR# resource -4033 to a unique folder name such as Launcher Items 2. Close the Launcher copy, answering yes when ResEdit asks if you want to save your changes, and you can keep the Launcher copy open at the same time as the original.

COLIN BURNETT
Nevada, Iowa



No More Guides This AppleScript deletes all guides in the frontmost QuarkXPress document. To use it, type it into Script Editor (which comes with System 7.5.X) or Scripter from Main Event Software (202/298-9595, *http://www.mainevent.com*), save as an application, and run it. Note that you will be asked to locate your copy of QuarkXPress if its name does not exactly match the name in quotes in the first line of this AppleScript.

While you're at it, change the references to the Launcher Items folder in item 3 of STR# resource 4033, item 3 of STR# resource 4034, and in STR resource 4033.—L.P.

Download to RAM Disk

TIP When using an online service like America Online or CompuServe, I've found that if I download files to a RAM disk rather than to my hard disk, I can cut 30 percent or more off my download time. This can be especially useful when downloading the latest multidisk Open Transport or Telecom Software Update from Apple. Just make sure that you don't forget to save your RAM disk contents before shutdown or you'll lose its contents!

BOB KOZLOWSKI
Concord, Massachusetts

Quick Bits

• Although you can find invisible files with the Find File utility in the Apple menu, George R. Pisani of Lawrence, Kansas, reports that the Mac Operating System won't let you move invisible files and folders to the Trash (as suggested in *Quick Tips*, December 1996). You can find invisible files and folders and move them to the Trash with the $25 shareware program File Buddy by Laurence Harris (available from Macworld Online). You can also make invisible files and folders visible with other utilities, including Apple's ResEdit (use ResEdit's Get File/Folder info command), and then drag the visible items to the Trash. Remember to use a copy of the original file when using ResEdit. **m**

LON POOLE answers readers' questions and selects reader-submitted tips for this monthly column. His latest book is *Macworld System 7.5 Bible*, third edition (IDG Books Worldwide, 1994).

Shareware mentioned in *Quick Tips* is available from Macworld Online (*http://www.macworld.com*) or America Online (keyword *Macworld*).

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OLYMPUS DIGITAL VISION

TO WILLIAM WEGMAN
(world famous artist/photographer)
IT'S A LAPDOG

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* The D-200L has 640 x 480 pixels. The D-300L has 1024 x 768 pixels.

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TO JARON LANIER
(digerati, composer, a pioneer in Virtual Reality)
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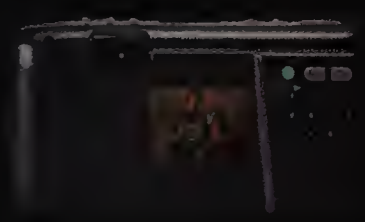

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A Travel Guide to Component Software

by Cameron Crotty

Component software is a classic example of the distance between the rubber and the road in the computer industry. Programmers have been talking about the benefits of component software for years, but it's only recently that the real world has even begun to approach the most primitive of whiteboard sketches or fill in the broadest strokes of blue-sky punditry.

In the last year, however, the buzz around component software has sharply intensified, partly because components look to be the next logical step in the evolution of software development after object-oriented programming.

Components are small pieces of software that concentrate on one or two specific functions instead of trying to cram a slew of features into a large application. The idea is that multiple components working in concert can do everything that a monolithic application can. Since they're small, components can be more easily developed and tested, and because they're designed to work together and be reused, components cut down on duplication of effort. For instance, a component that draws 3-D graphs could be used with a spreadsheet component to analyze data, and then with a page-layout program to create an informational graphic.

But even more people are interested in component software because it goes with the Internet like milk goes with cookies. Not enough bandwidth on the information superhighway? Software components are compact. Not sure what kind of platform, application, or document an end user will have? Software components are typically self-contained and can work together while knowing little about each other or the environment they'll wind up in. Finally, the Internet is about communication, and software components are *supposed* to talk to one another, whether they reside within a single machine, on the client and server on a LAN, or on two machines half a globe apart, connected by the Internet.

With these things in mind, I offer something of a travel guide to three of the newer technologies vying for primacy in the component-software world: Microsoft's ActiveX, Sun Microsystems' Java (and the related Java Beans), and Apple's OpenDoc. But before you hit the highway, be warned that it's easy to get lost on side roads. While these technologies are trying to solve (mostly) the same set of problems, their features and functions do not correspond directly to one another. Worse, the sponsoring companies do little to clear the way. Each claims its technology is the panacea, and all others merely pale imitations. So—with a full tank of gas and lunch packed in the cooler—onward!

The X-Files

While ActiveX is old news to Windows users, the technology is only now arriving on the Macintosh. As I write this, Microsoft has just released the first public beta and is planning to ship a final version by the end of 1996.

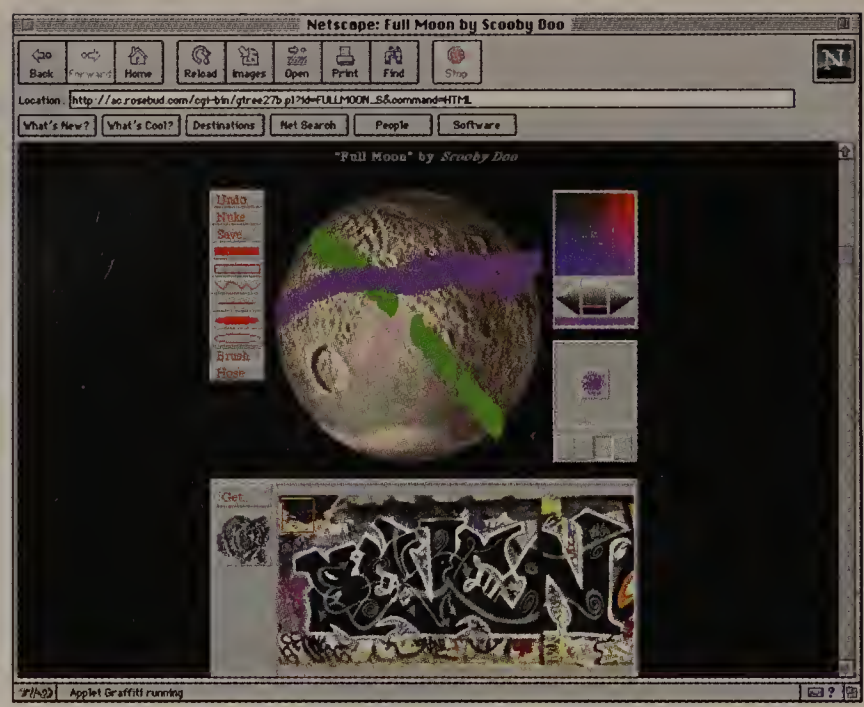
ActiveX is a *component architecture*, a set of rules and conventions that define how software components, called *controls* in ActiveX parlance, interact with each other (OpenDoc is also a component architecture, but its components are called *parts*). A control could be something as simple as a button or a scroll bar, or something as complex as a stock ticker that continuously displays the latest stock prices. As an architecture, ActiveX is generally more lightweight than OpenDoc: although OpenDoc provides functions that ActiveX doesn't, ActiveX components can be more compact and easier to develop.

Generally speaking, an ActiveX control doesn't exist on its own—it needs to live inside a container application, like a Web browser, which takes care of the larger environment issues such as providing the standard menu bar (File, Edit, Special) as well as the main application window. The control is free to focus on its specific task. In most cases,

continues

an ActiveX control requests window space from the larger application, and performs its actions within that window. However, ActiveX controls have full access to the complete array of system services on any given machine. In short, nearly anything that an application can do, an ActiveX control can do.

ActiveX controls have several advantages, the first being that they are usually written for a specific platform. While this means that a developer must create multiple versions of an ActiveX control to support multiple platforms, it also means that the controls will run efficiently on those platforms and take advantage of system-specific services (such as QuickDraw or the Sound Manager on the Macintosh). Mac owners, however, need only look at the number of Mac applications on store shelves, relative to the number of Windows applications, to see the downside of machine-specific development. The Windows ActiveX control market is currently large and thriving, but there's no guarantee that those developers will port their products to the Mac.



The World Wide Wall The most common place that you'll find Java applets these days is on the Web. The World Wide Wall (*http://ac.rosebud.com/graffiti/ac.html*) is under 100K, but contains many of the tools that you'd find in a full-scale painting application, including resizable brushes.

Too Much Coffee, Man

Besides bearing the product name that launched a thousand horrible coffee puns, Java has the honor of being another grand theoretical concept that finally made it off the drawing board and into the real world. Sun Microsystems' entire Java technology platform encompasses a great many things from hardware to software, but you're most likely to stumble across Java running an animation or adding interactivity to an interface at your friendly neighborhood Web site. For our travel guide, let's boil down the definition of Java (you didn't think I could resist, did you?).

Think of Java as a very special programming language. What makes this language unique is that the applications or applets (miniature applications) written in it do not run directly on your computer like ordinary applications. Instead, they run on a *virtual machine*, which you can think of simply as a Java-emulation engine, much the way you can run Windows software on your Mac by using Windows-emulation software. What makes this setup so convenient is that as long as a virtual machine is present, you can run a Java application on multiple platforms. In real life, this means that a PC owner and a Macintosh owner can hit a Web page with a Java applet embedded in it, and the same applet will work on both systems.

Java's biggest benefit is obvious: developers have to write only one application, and nearly anyone with a computer can run it (virtual machines are now available for most viable platforms). Builders of Web browsers (especially Netscape) snapped up Java as a compact way of adding sophisticated functions to Web pages, embedding Java virtual machines directly into their browsers. Microsoft and Apple are both caught up in the Java frenzy, currently promising to build virtual machines directly into their operating systems.

Java proponents also argue that these applets are inherently more stable than other kinds of software. They claim that the rigors of programming for a virtual machine prevent the most com-

Shareware PICKS

KEEPING YOUR HARD DRIVE organized used to be a snap when it could only hold a handful of files. But clutter becomes a problem when you can order megabytes with your computer the way you order fries with your hamburger.

Identifying the problem is the first step toward finding a solution. The next step often is mapping out the territory, a task that **DiskSurveyor** ($5; Tom Luhrs, TwiLight Software; *http://members.aol.com/twilightSW*) can handle for you. DiskSurveyor creates a graphical, hierarchical map of your hard drive. The software draws colored blocks representing the files and folders on your hard drive and sizes them proportionally to the space they take up so that you can easily identify and deflate oversize data fiefdoms. You have to pop back to the Finder to do the dirty work of shuffling and deleting files, but DiskSurveyor is still a handy reference utility to have around.

Uncovering space-wasting files and folders is only half the battle, though—especially if you're fond of cryptic file names and labyrinthine, sporadically used filing systems. You know that you should really just pitch all that old junk, but just as you can't resist sniffing the weeks-old plastic container of mystery mush in the back of your fridge, you just *have* to know what's in those moldering files before you trash them. When you're wading through a stack of mystery files, the Finder's Get Info command can be less than enlightening, unless you have fortified it with **Snitch** ($20; Mitch Jones; available from Macworld's Shareware archives at *http://www.macworld.com*). With Snitch, you can easily view and manipulate a file's type, creator, creation date, and modification date. Snitch can also display previews of both text and graphic files, as well as comments attached to StuffIt archives.

LOCKING THE BARN DOOR

Before the Horse Trashes Your Hard Drive

As the man said, "There ain't no such thing as a free lunch," and component software is no exception. Computer users who download software from the Internet risk damage to their machines from malicious applications or computer viruses. But today, you can minimize or eliminate the risk through the use of antiviral software and common sense when downloading applications. Furthermore, the World Wide Web, which is in the Internet vanguard, currently poses little threat, as Web pages are simply data that a browser downloads and interprets.

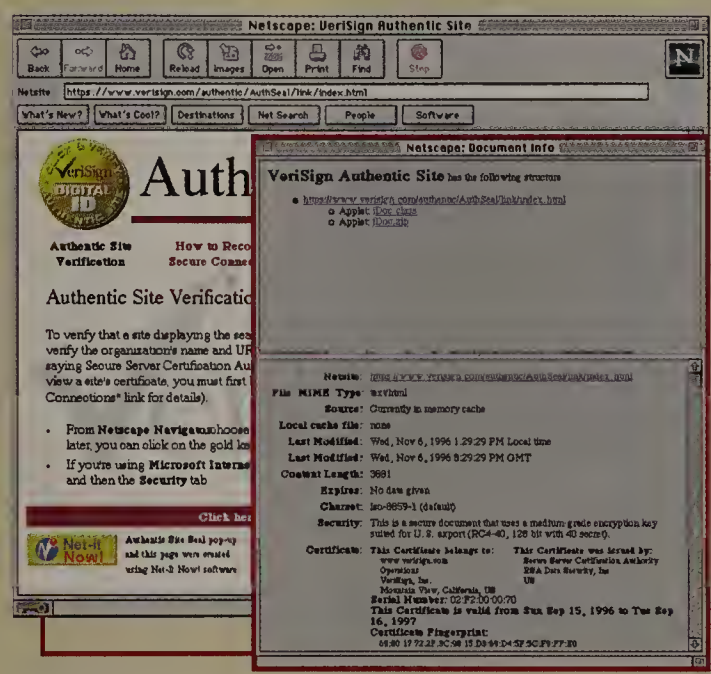
But as component software gains popularity, computer users will be downloading small, embedded applications more and more frequently. In fact, if the current trend toward compound documents continues, the idea of a data-only file is bound to become as obsolete as the 5¼-inch disk drive.

Both ActiveX and Java have built-in security features. Currently, Java attempts to protect users by limiting the activities of applets that have been downloaded from the Internet. Generally, these applets cannot access your file system, cannot make network connections except back to their originating hosts, and cannot run other programs or applets on the client machines. This means that an applet can't mess with the files on your hard drive, can't connect to anyplace on the Net except the server it came from, and can't start up a program that's going to wipe out your data or crash your machine.

Since ActiveX controls run directly on your machine, just like any other application, Microsoft has taken a different approach—it basically gives users a good-faith guarantee called *code signing*. Under this system, a software developer obtains a certificate from a third-party "certificate authority" (Microsoft is working with VeriSign and GTE).

Think of the certificate as being like the seals that royalty press into wax on letters they send to their minions. When the developer uses the certificate to digitally sign an ActiveX control, for instance, the signing software attaches a checksum and the developer's ID to the control. Much as royal minions can tell by the wax seal that the letter in their hands has come from the king and hasn't been opened, the end user's client software can tell by the digital signature whether the code has been tampered with. And since the developer's ID is stamped on the control, the end user can tell who's to blame should any problems arise.

Digitally signed code provides consumers with a sense of trust—backed up with some identification features—more than actual security. To get a software publisher's certificate, you must convince the certificate authority that you're an upstanding citizen. While certified developers *could* propagate malicious software, it would be difficult to do so anonymously.



Advance and Be Recognized Microsoft's Authenticode is still in the adoption stages, so we couldn't show you a software publisher's certificate, but this site-verification certificate will give you an idea of what to expect. Five bits of information are particularly important: who the certificate belongs to, who it was issued by, when it expires, and the certificate's serial number and fingerprint.

mon and damaging kinds of bugs from occurring, making fatal program errors less likely. If an applet does completely collapse, the virtual machine acts as an insulating barrier, preventing the exploding applet from taking down the rest of your system.

But there's a price to pay in speed and flexibility for completely portable applications. Anyone running 680X0 applications on a Power Macintosh knows all too well the bite that emulated code takes out of execution speed, and Java is no exception. Apple and others are currently working on the next generation of Java interpreters, called Just In Time (JIT) compilers. These interpreters dramatically improve performance by eliminating a couple of steps in the emulation process, but a Java application will still never run as quickly as an app coded specifically for the Macintosh (nor as fast as an ActiveX control or OpenDoc part).

Also, since Java is designed to span several platforms, it implements only the features common to all platforms; for instance, Java supports only one mouse button, even though Windows supports at least two. Furthermore, in the interests of security, Java applets hosted by other applications cannot access certain key system functions, such as the file system. This means that every time you hit a Web page containing a Java applet, you have to download the applet, even if you've been to that page before (this restriction does not apply to full-blown Java applications). For more information on security and component software, see "Locking the Barn Door before the Horse Trashes Your Hard Drive."

Another large drawback of Java is that applets cannot talk directly to one another, a deficiency Sun is trying to remedy with its Java Beans specification. The spec is a relatively new addition, and it will take several months to see how it will play out.

Apple Weighs In

Apple, of course, has its own component-software archi-

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Web Worthy

NO MATTER WHAT YOUR component religion, there's a space for you at **PartBank,** *http://www.partbank.com*, a site that distributes freeware, shareware, and commercial software components, including ActiveX controls, Java applets, OpenDoc parts, and even Netscape plug-ins. If you want to keep your finger on the component-software pulse, PartBank is a good place to start, as developers often post public beta versions of parts under construction. Becoming a member of PartBank (membership is free) entitles you to regular e-mail announcements and updates.

To get **technology updates** directly from the companies building the plumbing, go to *http://www.microsoft.com/activex/* for ActiveX info, and *http://javasoft.com* for the latest on Java. If you're tracking OpenDoc, *http://opendoc.apple.com* is Apple's contribution, but IBM does a much better job at *http://www.software.ibm.com/clubopendoc/*. CI Labs (*http://www.cilabs.org/*) is the group officially managing the Live Objects standards, of which OpenDoc is a large part.

tecture—OpenDoc—which it cosponsors with IBM. Like ActiveX, OpenDoc defines how software components interact with each other. When Apple and IBM first introduced OpenDoc, the two companies primarily envisioned compound documents (a word processing document with an embedded graph, for instance) on the desktop, and applications constructed of OpenDoc parts. But, as a component architecture, OpenDoc works well with the Internet. In fact, Cyberdog, Apple's high-profile Internet access tool, is based on OpenDoc. So far, though, OpenDoc hasn't hit the big time. Few major developers have even committed to using it; not many OpenDoc parts or containers are available (see "Web Worthy" for sites where you can find OpenDoc parts and containers). And there's no Windows version yet, although IBM says that one will be available by 1997.

OpenDoc will continue to face stiff competition from ActiveX for several reasons, including the fact that Microsoft backs ActiveX and that ActiveX, while not as robust as OpenDoc, is easier to implement due to its reduced functionality and the more robust set of developer tools available. On the Internet front, Netscape has agreed to develop an OpenDoc version of Navigator but has not announced a delivery date.

While the theories have been around for a while, component software is really still in its infancy. It could take years for ActiveX, Java, and OpenDoc to settle thoroughly into the market. In the meantime, sit back and enjoy the ride. **m**

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Media

The Site and Sound of MIDI

MIDI MUSIC ON THE WEB: THERE'S GOOD NEWS AND BAD NEWS

by Jim Heid

There's an adage we've all heard: the better something tastes, the more fattening it is. We need one for media: the more exotic the data type, the more disk space and bandwidth it demands. Of course, there are exceptions to both rules, and I waddle before you to discuss one of them: a low-fat media type called MIDI (Musical Instrument Digital Interface.) This hardware and software standard was created to enable musicians to connect synthesizers and play multiple instruments from a single keyboard.

MIDI has evolved into a medium that, among other things, lets you endow any interactive production with extremely low-bandwidth background music and sound effects. How low? How does 25K for a 5-minute music clip grab you?

But there are drawbacks to MIDI-based sounds. Foremost among them is that you have no idea how that 25K clip will sound when people play it back. I explain this and other MIDI matters this month; for links to information and MIDI music files, visit *http://www.heidsite.com*.

A Bit of MIDI Background

MIDI is a compact media type because it deals with note data. If you play the "Minute Waltz" on a MIDI keyboard, the instrument doesn't send 60 seconds' worth of CD-quality audio out of its MIDI jack; it sends data that says which notes were held down and for how long. Just as Macromedia FreeHand and Adobe Illustrator files are much smaller than Adobe Photoshop files because they store drawing instructions rather than digitized images, MIDI files are far smaller than audio files because they store playback instructions rather than digitized audio.

MIDI supports up to 16 independent sets, or tracks, of note data. You can assign each track a different instrumental sound. Using a software package called a *sequencer*, musicians can record and play back multiple tracks, building up complete arrangements one instrument at a time. Musicians can then save those sequences as *Standard MIDI files*—the cross-platform exchange format for MIDI tunes.

MIDI has unleashed a flood of amazing synthesizers, and now personal computers have joined the band. Most Microsoft Windows machines include sound cards containing MIDI synthesis features. On the Mac side, QuickTime provides software-only MIDI playback;

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some third-party software-only alternatives are also available.

Of course, Mac and Windows users can add to their systems' MIDI playback capabilities with a real MIDI instrument. For this column, I tested and was amazed by Roland's (213/685-5141, *http://www.rolandus.com*) $595 PMA-5 Personal Music Assistant. Imagine an Apple Newton MessagePad that has had music lessons, and you get an idea of what this paperback-size device can do.

All of these hardware and software options adhere to a relatively recent variant of the MIDI standard called *General MIDI*, which spells out a library of instrumental settings. A MIDI file prepared for a General MIDI playback device will play back the correct sounds, but their quality varies dramatically.

The Web Angle

Versions 3 and later of both Microsoft Internet Explorer and Netscape Navigator support MIDI playback—Navigator through its LiveAudio technology, Internet Explorer via Microsoft's ActiveX (for more on ActiveX, see *NetSmart*, in this issue). For sound generation, both browsers use whatever MIDI features a surfer's computer happens to have.

Third-party MIDI plug-ins are also available for Navigator 2.X and Internet Explorer 2.X. LiveUpdate's Crescendo (*http://www.liveupdate.com/crescendo.html*) is free as a plug-in for Navigator and as an ActiveX control for Explorer.

Yamaha has developed a slick plug-in called MidPlug that provides its own software-only MIDI sound generation, with sound quality superior to that of QuickTime's built-in instruments; get it at *http://www.yamaha.com*.

Each of these playback tools handles standard MIDI files, whose names end with the extension .mid. You can embed MIDI files in Web pages using the HTML **<embed>** tag. You can also use the standard anchor tag (**<a>**) to create a hyperlink to a MIDI file.

Here's another playback alternative: use Apple's Movie Player utility to convert a standard MIDI file into a QuickTime music movie, then embed that file using QuickTime's variant of the **<embed>** command (see *http://quicktime.apple.com/dev/devweb.html*). With this approach any visitor whose browser supports QuickTime playback can hear the music. Plus QuickTime music movies contain a controller bar that lets listeners move around within a song. Some MIDI plug-ins provide play, stop, and pause buttons and volume controls, but none offer the convenience of navigation bars.

The Bad News about MIDI

The biggest drawback to MIDI as a vehicle for music and sound on the Web is that sound quality depends on a visitor's sound card or playback software. High-end Windows sound cards are stunning, but many older or low-end cards sound downright cheesy, as do Apple's QuickTime-based MIDI instruments. InVision Interactive's (415/812-7380, *http://www.cybersound.com*) $99 CyberSound Studio gives Power Macs better-sounding General MIDI playback and plugs into QuickTime's music architecture, but can you expect your site's Mac-owning visitors to buy and install third-party sounds to enjoy your soundtracks fully?

There are other problems. Many

Steps to MIDI Music

ADDING MIDI MUSIC to a Web site is a three-step process: you create or obtain the clips, configure your server, and then embed the clips.

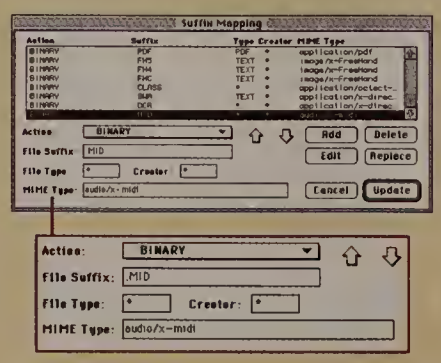
STEP 1: Get Your Songs

If you're a MIDI musician, you have everything you need. Simply prepare clips with General MIDI instrument assignments, and save them as Standard MIDI files. Nonmusicians can find dozens of Web sites containing thousands of downloadable MIDI files. My favorite is the Classical MIDI Archives, at *http://www.prs.net/midi.html*, which contains nearly 3000 classical sequences. Harmony Central is another terrific music site; its MIDI links page (*http://www.harmony-central.com/MIDI/files.html*) contains pointers to dozens of sources for MIDI files. Be sure to read a site's copyright and permissions notices before posting any of its MIDI files on your site.

STEP 2: Configure Your Server

To embed MIDI clips, your Web server must have the proper *suffix map* for MIDI files. If you're using Quarterdeck's WebStar, use the WebStar Admin utility, choose Suffix Mapping from the Configure menu, and set up a suffix map as follows: set action to binary, set suffix to .mid, and set MIME type to audio/x-midi.

If you're using an Internet service provider, contact its support staff and verify that its servers are configured for MIDI files as described above.



STEP 3: Embed the Clips

You can include a MIDI clip in a Web page using the **<embed>** tag as shown below. All MIDI-playback plug-ins support an autostart attribute that controls whether the clip starts automatically (**<autostart=true>**) or requires users to click on a controller's playback button (**<autostart=false>**).

Unfortunately, each plug-in also provides some unique attributes that require unique HTML coding. That makes it cumbersome to write an **<embed>** tag that works with all possible plug-ins. To further complicate things, some plug-ins also provide a choice of on-screen controllers; you can choose a controller by adding the appropriate attributes, as shown at right.

Works with All Plug-Ins

The following **<embed>** tag works with all MIDI plug-ins.

<embed src="*URL_to_song_here.mid*" width=200 height=50 controls=smallconsole>

<noembed>

<ahref="*URL_to_song_here.mid*">Download the MIDI file.

</noembed>

The **<noembed>** and **</noembed>** tag pair enables visitors whose browsers don't support embedding to download the file.

For this tag to work with all plug-ins, the height and width parameters must be large enough to accommodate the largest controller of any plug-in—which is Crescendo's. Because of this, minor cosmetic glitches appear with plug-ins whose controller dimensions are smaller than Crescendo's 200 by 50 pixels. You can often fix these glitches by using a white background color (**<body bgcolor=ffffff>**).

users have browsers that don't support MIDI playback; other users may have the browser but no MIDI plug-in, or they may be on a machine that lacks a MIDI playback device. Finally, embedded MIDI tracks can be annoying, and many people might just prefer to surf quietly.

Rather than forcing MIDI sounds on your visitors, give them a choice. Include a link in an unobtrusive spot on a page: "A MIDI soundtrack is available." Instead of embedding the clip, reference it with an anchor tag so visitors can choose whether to download the clip. Or embed it, but use the **autoplay=false** attribute. This way, the clip doesn't begin playing automatically—the visitor must click on a controller's play button.

Other Ways to Make MIDI Music

But who says MIDI files have to be background music? They could serve just as well in an educational site on music theory (for a real-world sample, check out Piano on the Net, at *http://www.artdsm.com/piano*) or in an online "Name That Tune" game—applications where the ability to play notes is more important than how convincing those notes sound.

Want to create an interactive button that plays a sound when a visitor clicks on it? Create a single-frame QuickTime movie, then paste a short MIDI riff into it. In the movie's **<embed>** tag, use the **<href>** attribute to include the URL of the page that you want to appear when a visitor clicks on the button (for example, **<embed "movie.mov" height=30 width=30 controller=false href="http://www.yoursite.com/page.html">**).

Several of General MIDI's instrument assignments aren't instruments at all, but sound effects—birdcalls, ocean surf, helicopter rotors, applause. These sounds could have a place in an entertainment or travel site.

These simple examples show that MIDI's applications go beyond creating background music. In the end, MIDI is a lot like low-fat food: using it when you can live with its limitations allows you to indulge in the rich stuff now and then. **m**

Contributing editor JIM HEID's latest book is *HTML & Web Publishing Secrets* (IDG Books Worldwide, 1997).

Supporting Specific Plug-in Features

IF YOU MAKE visitors use a specific plug-in, you can take advantage of its unique features—Netscape LiveAudio's are described here. In fact, each plug-in ignores HTML attributes it doesn't understand, so you can mix attributes to support several unique features. LiveUpdate's Crescendo and Yamaha's Mid-Plug also offer a variety of controller styles and attributes (check them out at *http://www.heidsite.com*).

LiveAudio Controllers In addition to the controllers below, you can create custom controllers and use JavaScripts to defer the loading of a clip until the controller's play button is pressed. For details, see *http://home.netscape.com/comprod/products/navigator/version_3.0/multimedia/audio/how.html*.

Attributes	Result
width=144 height=15 controls=smallconsole	 small console
width=144 height=60 controls=console	 large console

LiveAudio Playback Options LiveAudio lets you control playback in various ways.

Attributes	Result
loop=X	Loops clip for specified number of times; for example, **loop=2** plays clip two times.
starttime="X"	Begins playback at specified point in clip; for example, **starttime="1:00"** begins playback at the one-minute point.
endtime="X"	Ends playback at specified point in the clip.
volume=X	Sets playback volume (0 is down all the way; 100 is up all the way).

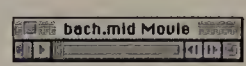
MIDI to Movie

USING APPLE'S MOVIE Player utility with its authoring extensions (all available from *http://www.quicktimefaq.org*), you can convert standard MIDI files into QuickTime music movies.

1. Launch Movie Player, choose its Open command, and locate the MIDI file you want to convert.

2. Specify a name for the converted file and then click on Save (or press return).

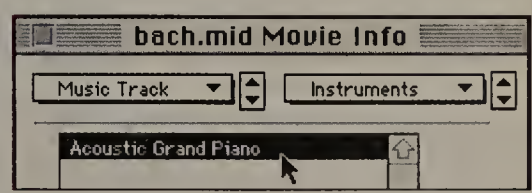
3. The converted movie opens with a standard QuickTime controller bar.



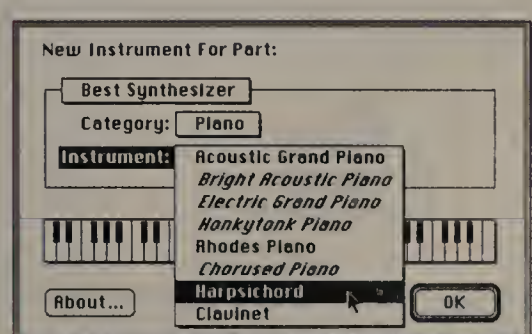
Changing Instruments

If you like, you can change the MIDI track assignments.

1. Choose Get Info from the Movie menu to display the Movie Info window, then configure the pop-up menus as shown here. (If you don't see these options, you don't have the Movie Player authoring extensions. Download them from *http://www.quicktimefaq.org*.) In the Movie Info window, double-click on the track whose instrument you want to change.



2. Select the desired instrument and then click on OK. Choose a category (piano, strings, and so on) and an instrument (QuickTime does not include instruments whose names are in italics). You can click on the keyboard to hear the currently selected instrument.



Publishing Workshop

QuarkXPress Tips and Tricks

by David Blatner

There's nothing like a good tip. The eyes light up, the lungs fill with air, the mind opens. "Ah!" you say, "I didn't know you could do that." A good tip is a pleasurable thing. There are literally hundreds of good ones for QuarkXPress. Though I certainly can't fit all of them in here, I'll share just a few of my favorite techniques. Who says you can't teach an old dog new tricks?

Changing the Defaults

The one question I'm almost always asked at conferences is, "How can I change the default font for a text box from Helvetica to something else?" The answer: change the definition of the Normal style sheet by selecting Style Sheets from the Edit menu, clicking on Normal, and then clicking on the Edit button.

You can change all sorts of other values, too. For example, have you noticed that when you drag a guide out onto your page, it sits behind all the text boxes and picture boxes so you can't see it? Is that bizarre, or what? You can change it by opening General in the Preferences submenu under the Edit menu and changing the Guides pop-up menu to In Front.

A change made to the Style Sheets dialog box, the Colors dialog box, or any Preferences dialog box (other than the Application dialog box) while a document is open changes *that* document only. If no documents are open, XPress changes every document you create from then on.

Absolute Page Numbers

Many people are familiar with using the Section feature (under the Page menu) to change a document's page numbering. For example, you can make the document begin with page 57 (odd-numbered pages are always right-hand pages). However, what happens when you want to print the 9th page, or jump to the 13th page of that document? If you use the Go To command (⌘-J) and type 9 or 13, you get a message that these page numbers don't exist. In this dialog box, simply type **+9** or **+13**. This plus sign has nothing to do with addition—rather, it makes the numbers absolute (+9 is the 9th page of the document).

Fast Font Selection

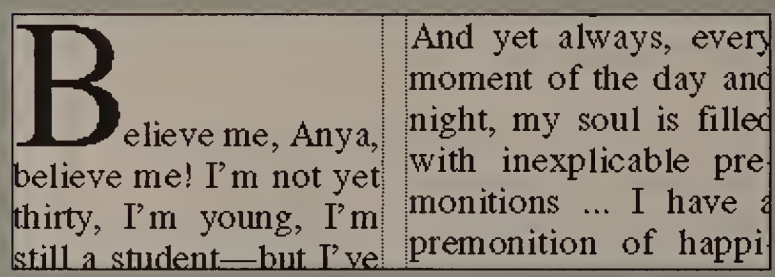
Did you know that you can type ⌘-option-shift-M to jump quickly to the Font field on the Measurements palette? Then you just type the first few letters of the font you want. For instance, type **Ti**, and XPress guesses that you want Times Roman. You also can move through the menu by pressing option-F9 to jump to the next font in the list. (If you use Adobe Type Reunion, that next font may be a surprise.)

Pressing ⌘-shift-Z sets the next character you type in a text box to the Zapf Dingbats font, then switches back to the font you were using before. **m**

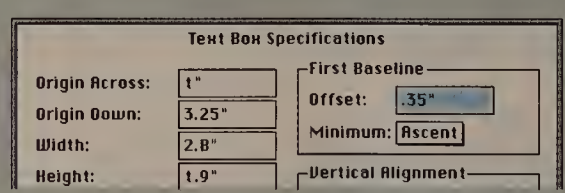
DAVID BLATNER's newest book is *Real World QuarkImmedia* (Peachpit Press, 1997). He also wrote the Tip-of-the-Day XTension in Extensis's QX-Tools package. You can send him tips and tricks at *david@moo.com*.

Aligning Baselines

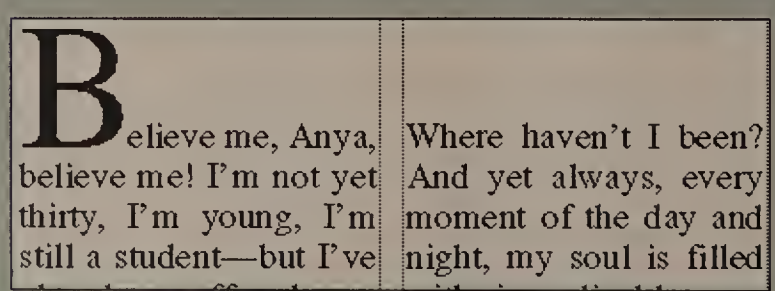
QuarkXPress makes it easy to add a drop cap or to raise the first character in a multicolumn text box, but have you noticed that each column's text baselines stop lining up properly?



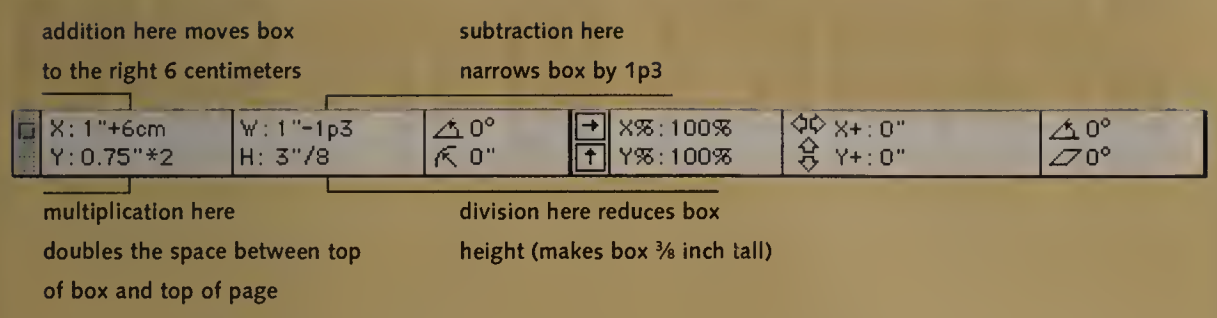
You can fix this by selecting Modify from the Item menu (or pressing ⌘-M) and setting First Baseline to a value slightly greater than either the size of the body text (for drop caps) or the size of the raised cap.



The greater offset lets the columns line up correctly.

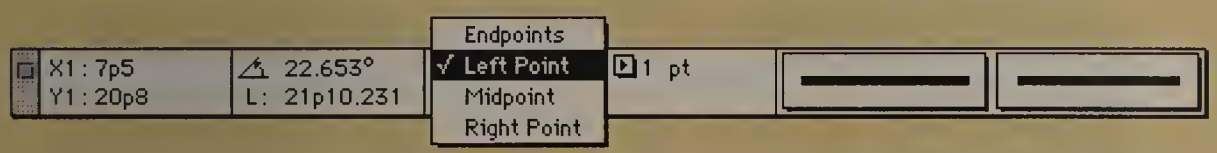


PALETTE POINTERS



Math and Measurements I love the look of astonishment I get when I show people that they can turn every palette or dialog box in QuarkXPress into a mathematical calculator. It's something few people have ever even considered. You can do addition, subtraction, multiplication, and division. For instance, if you want to make a picture box half as wide, just put **/2** or ***.5** after the value in the W field of the Measurements palette. If you want to move a picture box down 4 centimeters, place **+4cm** after the value in the Y field of the Measurements palette. XPress does the math when you click out of the palette, or press return or enter.

You can even mix measurement systems or build longer equations. Say you have a box sitting at 4 picas and you want to move it 1/16 inch to the right, you could type **+1"/16** after the 4p in the X field. XPress does division and multiplication first, then addition and subtraction. (Note that you cannot multiply or divide by a measurement.) Letting XPress do the math for you makes life so much easier when you're building layouts quickly.



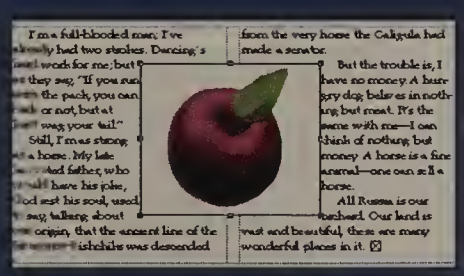
Line Modes When you select a line on your page, the default Measurements palette displays the line's left and right end-point coordinates. That means if you want to move or change the line by entering numbers, you have to figure out the proper coordinates for the new left and right end points. What a pain. Instead, change the setting in the line mode pop-up menu on the Measurements palette (most people don't even notice that a pop-up menu is sitting there).

The Measurements palette displays the coordinates of the mode you're in. In Left Point mode, it shows the coordinates of the left point, the angle of the line from that point, and the length of the line. This makes it a snap to change the line's position, angle, or length with accuracy.

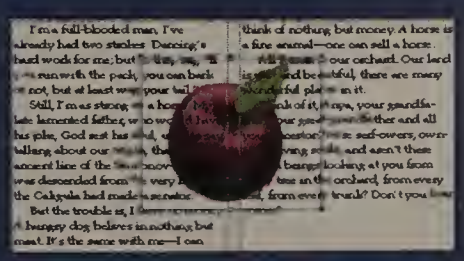
AVOIDING CLIPPING PATHS

Building clipping paths around a silhouetted image is a pain in the mouse finger. If you're building a clipping path in Photoshop just so that type will flow around the image correctly in XPress, you may be working too hard. If the image fades out to the color of your page (white, usually), you can take advantage of XPress's Manual Runaround feature to create a peephole in your text that's the same shape as your image.

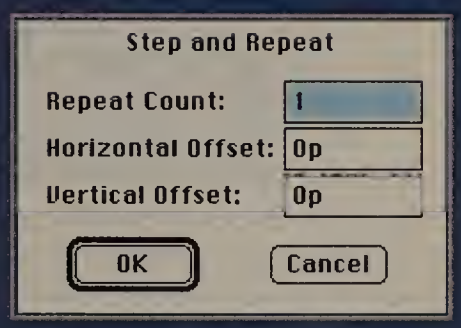
1. Import the image into a picture box using Get Picture from the File menu and place the image where you want it on the page.



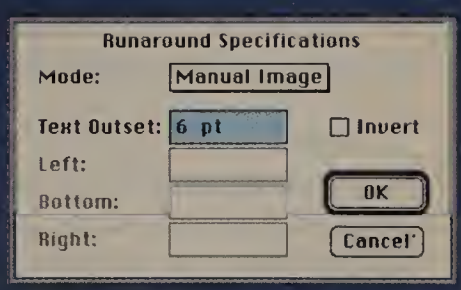
2. If the picture's background color is None, the picture may look right on screen, but the lack of a clipping path may cause problems when you print. Set the picture's background color to white, and send it behind the text box (choose Send to Back from the Item menu or press shift-F5). Set the text box color to None in the Text Box Specifications dialog box.



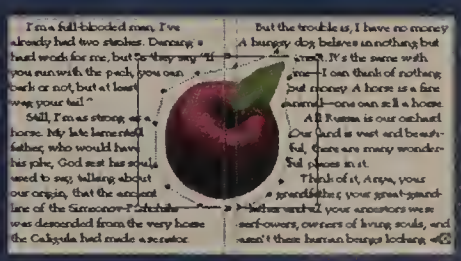
3. Use Step and Repeat to make one copy of the picture box; set both offsets to zero. Bring this copy to the front (choose Bring to Front from the Item menu, or press F5).



4. Set the copy's Runaround specifications to Manual Image (select Runaround from the Item menu, or press ⌘-T). Adjust the runaround polygon to taste.



5. Delete the image from the copy of the picture box using the Content tool. This removes the image but leaves behind the runaround polygon. The text now appears to run around the image, even though the image is behind the text. You might even want to group the two picture boxes so you don't accidentally move one without the other.



Graphics Workshop

Creating 3-D Type with Facets and Gradients

by Cathy Abes

ARTIST Daniel Pelavin is an illustrator and type designer based in New York City, whose work has appeared in many publications, including *Step-by-Step*, *Macworld*, *MacUser*, and *Computer Artist*, and numerous books, including *The History of Graphic Design*, by Philip B. Meggs (Van Nostrand Reinhold, 1992).

HOW IT WAS DONE Even though he could have used a plug-in to automatically create type with bevels and facets within Adobe Illustrator, Pelavin feels the results look artificial, so he builds his own. And doing it manually gives him complete control—including the ability to tweak any individual point.

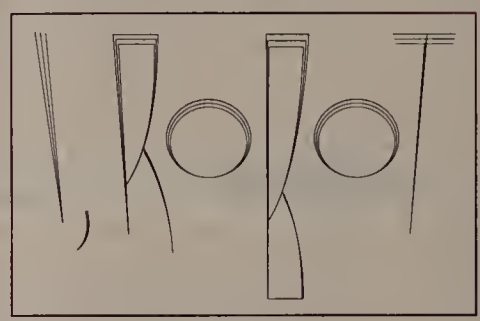
Macworld asked Pelavin to design a book cover that would incorporate 3-D type, and he chose Isaac Asimov's science fiction classic *I, Robot*.

Pelavin began by drawing the center lines and curves for the word *robot*, duplicated the lines, and scaled them to create type that tapered from wide at the top to narrow at the bottom. Then he created the outer shapes of the letters.

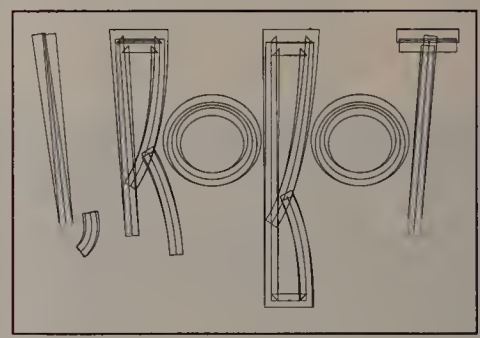
After drawing the facets and separating them into individual shapes, he drew an outline around the entire word to make it stand out.

Next Pelavin began to block in the colors, starting with flat colors and adding gradients to provide subtle definition and lighting effects so the facets would look more dramatic.

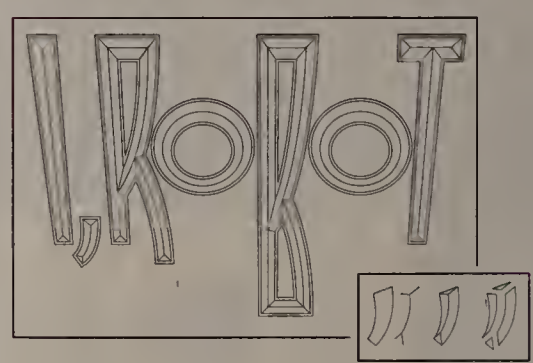
THE TOOLS **Hardware:** Macintosh IIci with 80MB of RAM, a 100MHz DayStar Turbo601 upgrade card, and a 240MB internal drive; a 2GB external hard drive; a Logitech Scanman; an HP DeskJet 1200C/PS printer. **Software:** Adobe Illustrator 6.0.1.



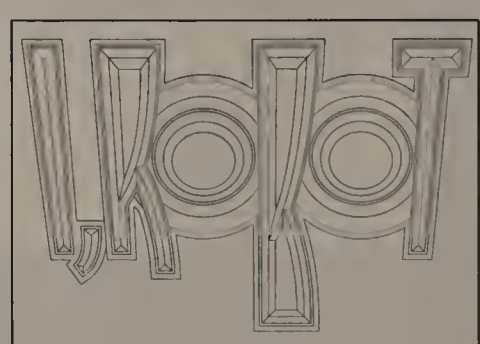
1 To create the word *robot*, Pelavin began by drawing the letters' center lines, using the ellipse tool for each o and the pen tool for the other letters. He then duplicated those lines and scaled them, clicking at the bottom and dragging upward to make the letters wider at the top.



2 After saving a copy of the letter shapes to preserve their centers—which he would need to create the facets—he expanded the strokes to create outlines of the individual letter shapes.

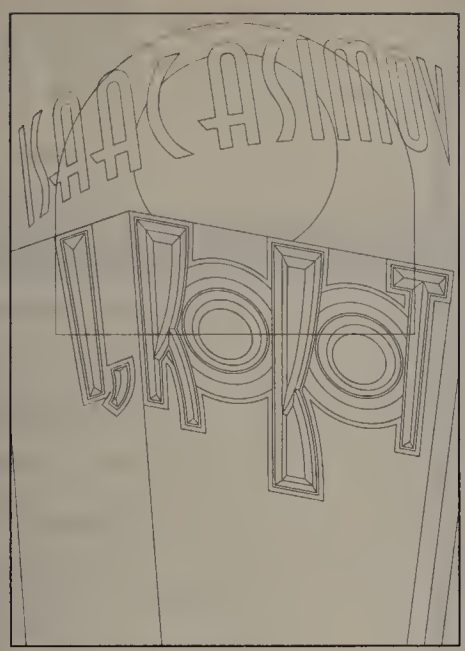


3 He created the facets on the copy by drawing lines connecting the corners of the letter outlines to the ends of the center lines, and then used the Divide filter to break the facets into individual paths so he'd be able to fill each one with a separate color.



4 Pelavin used the Offset Path filter to draw an outline around the entire title to give it emphasis.

❺ Using the Shear command, he skewed the word and then the facets to give the title perspective, setting the skew angle to –169 degrees and the axis to –90 degrees.



❻ After deciding on an imaginary light source (in the upper-right corner) to determine the shading of the facets, he began to block in the colors, making the facets at the top and the right lighter and those at the bottom and the left darker.

❼ To heighten the simulated lighting effect, Pelavin transformed the facets' flat color fills into gradients to make the inside facets darker at the top and the outside facets darker at the bottom.

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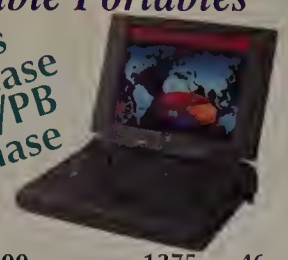

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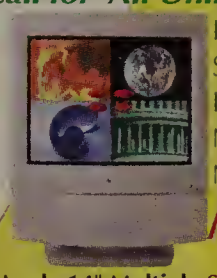

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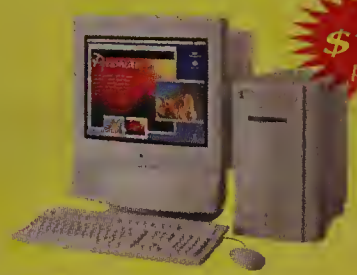

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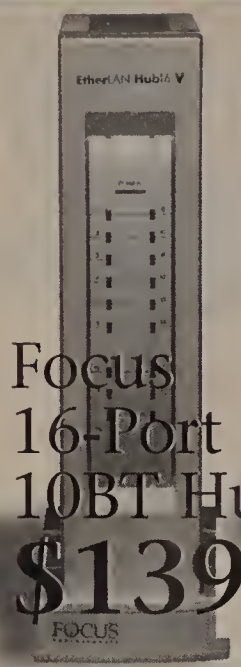

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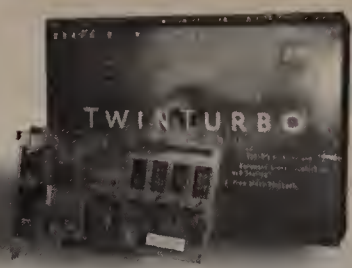

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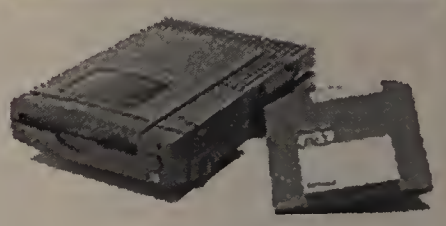

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3000/200 mini-tower	200MHz PowerPC 603e	32MB	2.4GB	8X	28.8K bps	1MB	$2009.47	76821
4000/160 desktop	160MHz PowerPC 604e	16MB	1.2GB	8X	optional	2MB	$2129.61	76822
4000/160 mini-tower	160MHz PowerPC 604e	32MB	2.4GB	8X	optional	2MB	$2258.88	76824
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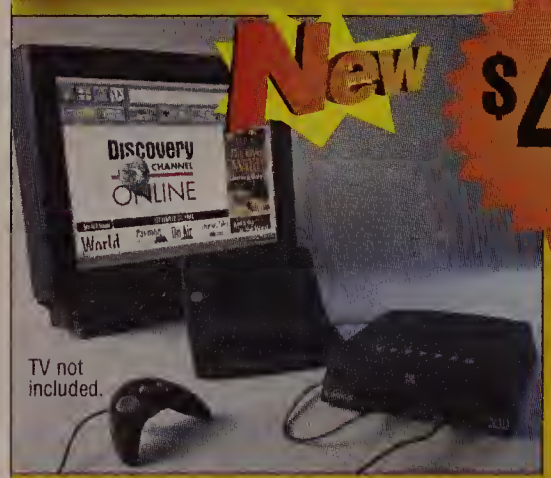

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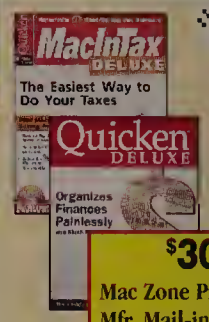

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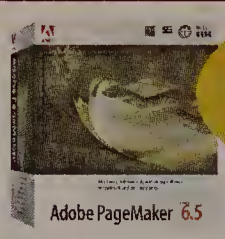

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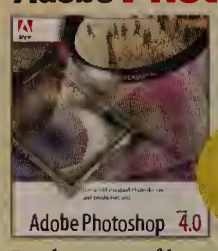

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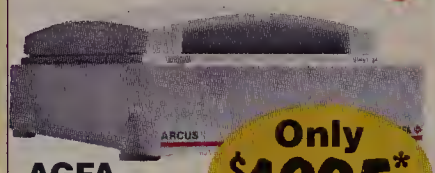

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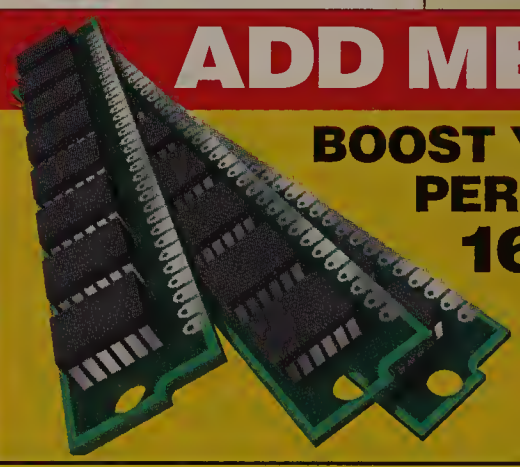

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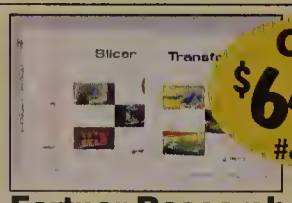

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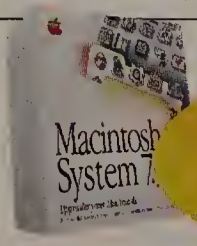

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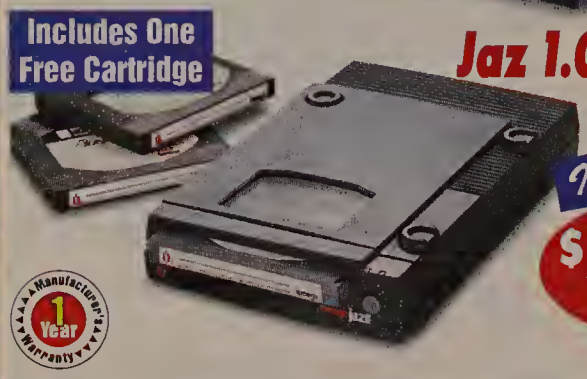

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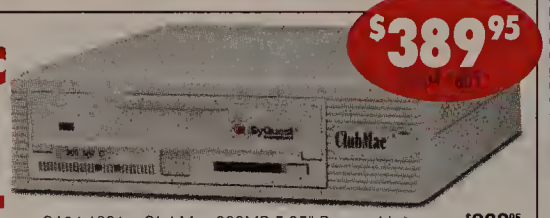

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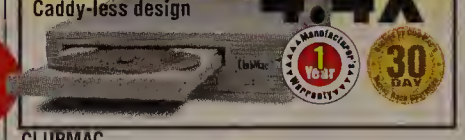

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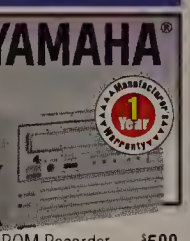

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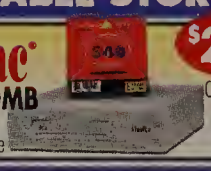

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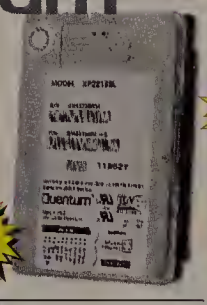

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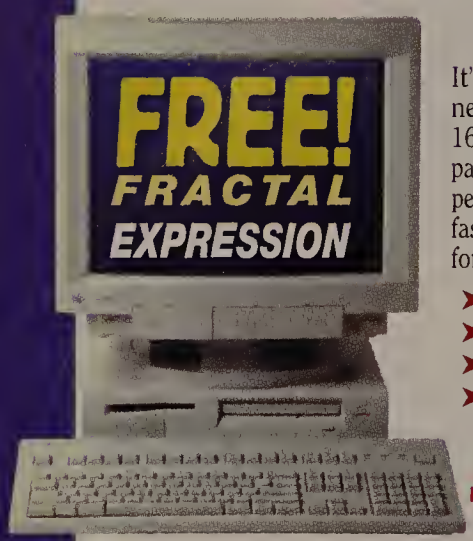

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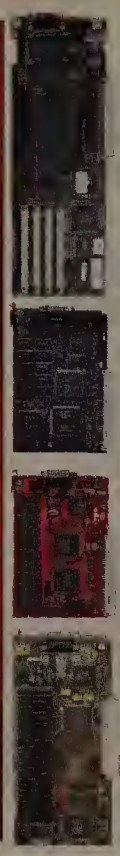

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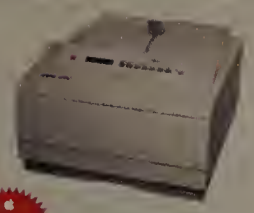

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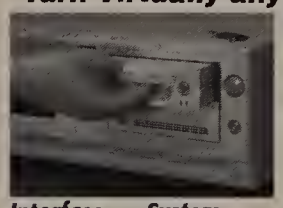

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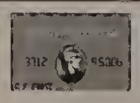

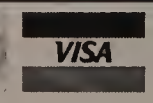

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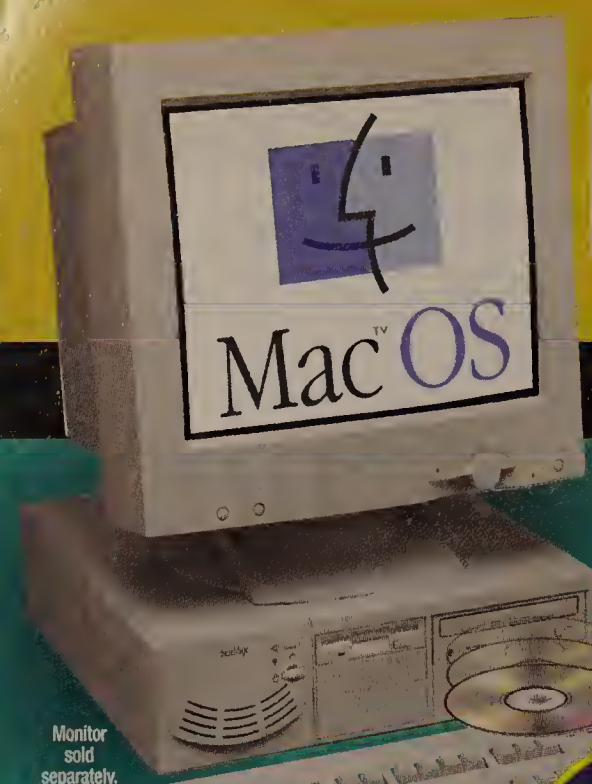

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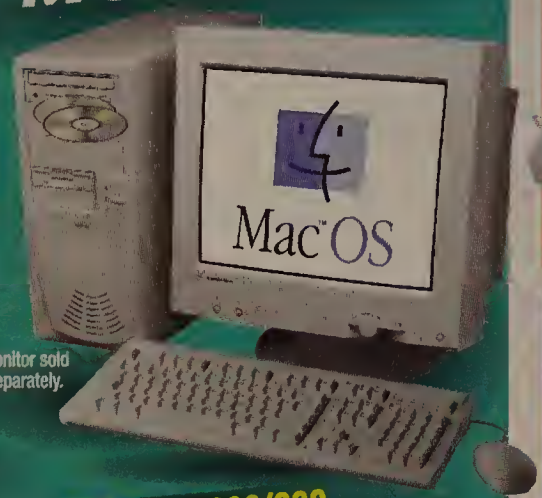

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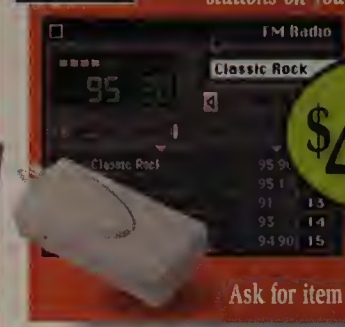

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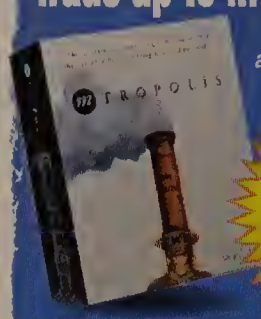

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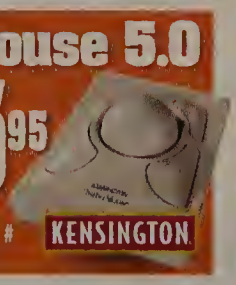

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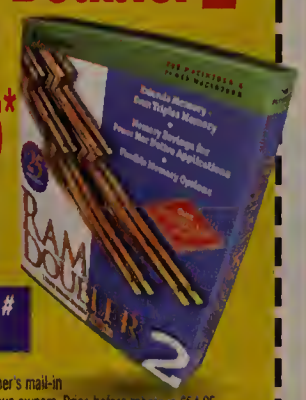

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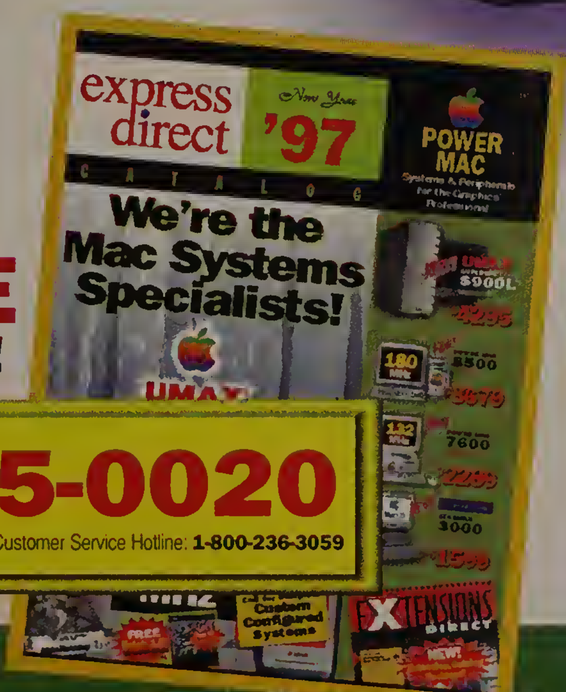

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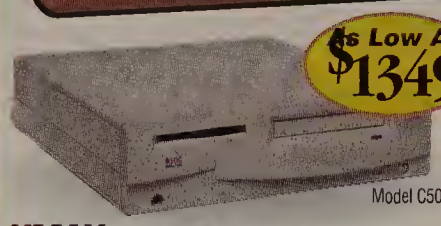

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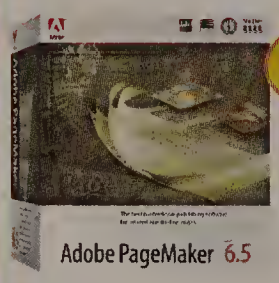

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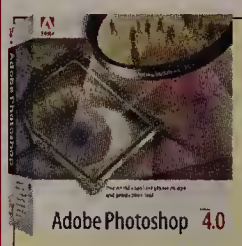

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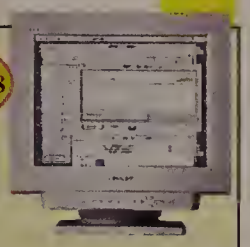
87426 VST Expan Bay 230MB MD Dr. for PB 190/5300 ..... $381.31



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Sony Multiscan 15sx 15" Monitor (13.9" viewable image size)

- .25mm dot pitch
- Max resolution of 1024x768 at 75Hz

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94094 Fuji 3.5" MF2HD Mac Formatted 10-Pk 1.4MB $5.20
91952 Fuji CDR-74 ..... $7.80
05717 Fuji DG90M 4mm Data Grade Tape 1.95GB $6.51

Iomega

97291 Bernoulli MultiDisk 150MB Single Cart $94.49
91160 Zip Media Mac100 3-Pack $49.99
91161 Zip Media Mac100 10-Pack $149.99
91159 Zip Media Mac100 Single $17.64

Kyocero

86251 Kyocera CDR-74 ..... $7.79

Performontz

83437 Performantz 10x Ext CD Drive $199.88
83400 Performantz 4x CD Drive $129.29

Philips

89805 Philips CD-Recordable 74 Min. Disk $7.80

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01140 Sony 3.5" 230MB M.D. 512b/s $18.32
14368 Sony CD-R 650MB 74 Min. Disk $6.54
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SyQuest

00278 SyQuest 200MB 5.25" Removable Cartridge $164.49
97992 SyQuest 270MB 3.5" Removable Cartridge $51.19
02183 SyDuest 44MB Cart Unfo $41.19
00183 SyDuest Cart 88MB $43.39
24910 SyDuest EZ135MB 3.5" Cartridge 10-Pk $198.89
24909 SyDuest EZ135MB 3.5" Cartridge 5-Pk $109.99

Verbotim

91979 Verbatim 230MB 3.5" M.O. Mac Formatted $20.82
01169 Verbatim 230MB 3.5" R/W 1024b/s $18.25
21922 Verbatim CD-R 74 Min. 4X $7.81

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84141 AGFA SnapScan $327.08
89851 AGFA StudioScan IIsi Color Scanner $649.98
06685 AGFA StudioStar $792.79

Epson

91939 Epson ES-1000C Flatbed Scanner $575.51
82673 Epson Expression 636 Professional Scanner $1778.99
82671 Epson Expression 636 Executive Scanner $858.88
06919 Epson Transparency Unit - Enhanced $617.98

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84149 UMAX Powerlook II w/TMA & Phtshp LE $1811.46
21401 UMAX Transparency Adapter for Vista $190.90
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83505 UMAX Vista-S12 w/Adobe Photoshop LE $620.45

Umax

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Visioneer

86783 PaperPort Vx SCSI Adapter for Mac $57.42
88164 Visioneer PaperPort Vx For Macintosh $280.79

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91854 Adesso Soft Touch Keyboard $44.09
90766 Tru-Form Extended Keyboard $73.18
91099 Tru-Form Extended Keyboard w/Pointer $82.05

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94461 Extended Keyboard II $154.49

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91869 Drawing Slate II 12x18 w/Pressure Pen $272.61
91864 Drawing Slate II 6x9 w/Pressure Pen $212.05

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05998 Gravis MouseStick II $40.39

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93628 Kensington Thinking Mouse ADB $63.17
87483 Turbomouse 5.0 ..... $100.94

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99364 APC Back-UPS 400 ..... $141.11
11651 APC Back-UPS 600 ..... $238.52
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94393 APC Prof Surge Arrest 7 Outlet w/Phone $32.42
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88751 BTI Auto Pwr Adpt f/PB 5300/190 Series $53.60
06022 BTI PB 140-180c 3.2Ah Battery $48.65
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85820 Internal 5300/190 Battery $78.71

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- ✔ Reliable 4500 rpm mechanism
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- ✔ 4500 rpm mechanism

2GB is too little, 4GB is too much. The new APS Q 3200 is priced lower than some 2GB SCSI drives, yet it delivers a perfect 3000MB of reliable storage. This drive uses MR heads and an advanced PRML read channel to fit its 3GB into a 3.5" low profile Ultra SCSI drive.

1.2GB OF STORAGE FOR ONLY

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- ✔ Works on SCSI-2 and Ultra SCSI buses

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Finally there's a hard drive that combines the reliability of a 4500 rpm mech. with high performance. The APS Q 1280 uses MR heads, PRML and Ultra SCSI technology for improved performance. It is backed by a 3-year warranty.

APS M•Power 603e160™

- ✔ 160MHz Motorola® PowerPC 603e processor
- ✔ 1.2GB hard drive
- ✔ 10X CD-ROM
- ✔ 16MB of RAM

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Mac OS

APS M•Power 603e200™

- ✔ 200MHz Motorola® PowerPC 603e processor
- ✔ 1.2GB hard drive
- ✔ 10X CD-ROM
- ✔ 16MB of RAM & 256K L2 Cache

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- 2-5.25" Half Height Internal Bays*
- 2-3.5" Low Profile Internal Bays*
- 3-PCI Expansion Slots

INTERFACES
- Printer Port
- Modem Port
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INCLUDES:
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- 16MB RAM
- 1.2GB HD
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- ADB Keyboard & Mouse
- One-Year Limited Warranty

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*Monitors are not included.

*Filling all available drive bays may exceed power limitations.

APS DESKTOP DRIVES

Model	Capacity/Awards	Internal	SR2000
APS Q 1280 Quantum Fireball™	1222MB	$249.95	$299.95
APS Q 2100 Quantum Fireball™	2000MB	329.95	379.95
APS Q 3200 Quantum Fireball™	3000MB	399.95	479.95

- 30-day money-back guarantee on all APS brand drives and accessories. Your risk is the cost of shipping.
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- Refused orders subject to 20% restocking fee.
- International customers must pay for all shipping charges.
- Listed capacities are formatted.
- Actual data compression and tape capacity vary greatly depending on the type of data recorded, other system parameters and environment.
- Prices and specifications are subject to change without notice.
- You need to install system software appropriate to your machine before using our hard drives.
- Not responsible for typographical errors.
- © 1996, Alliance Peripheral Systems, Inc. All Rights Reserved.

APS HIGH-PERFORMANCE DRIVES

Model	Capacity	Internal	SR2000	APS Pro
APS WD 4300 Western Digital Enterprise	4200MB	1099.95	1099.95	1199.95
Ultra/Wide available for an additional $100.00				
APS Q 4300 Quantum Atlas II 7200 rpm	4341MB	899.95	949.95	999.95
Ultra/Wide available for an additional $100.00				
APS MS 4300 Micropolis 4345 7200 rpm	4240MB	999.95	1049.95	1099.95
Ultra/Wide available for an additional $100.00				

APS HIGH-PERFORMANCE DRIVES

Model	Capacity	Internal	SR2000	APS Pro
APS Q 9000 Quantum Atlas II 7200 rpm	8682MB	1499.95	1549.95	1599.95
Ultra/Wide available for an additional $100.00				
APS MS 9000 Micropolis 3391 7200 rpm	8669MB	1899.95	1949.95	1999.95
Fast/Wide available for an additional $100.00				

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- ✔ 10X CD-ROM
- ✔ 32MB of RAM

Mac OS

604e200

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- 5-3.5" Low Profile Internal Bays*
- 5-PCI Expansion Slots

INTERFACES
- Printer Port
- Modem Port
- ADB Port
- IDE Bus
- SCSI Port
- Supports 14", 15", 17" & 21" Monitors
- SVGA Monitor Port
- 2-PS/2 Ports
- 16-bit Sound Output Port
- Rear Headphone Jack
- Microphone Jack

INCLUDES:
- 10X CD-ROM
- 32MB RAM
- 3.2GB HD
- Floppy Drive
- 2MB VRAM
- 512K L2 Cache
- ADB Keyboard & Mouse
- One-Year Limited Warranty
- Mini-Tower Case

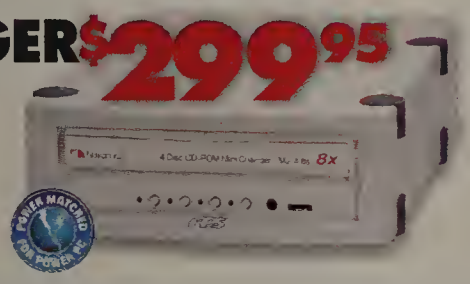
$2599*

*Filling all available drive bays may exceed power limitations.

*Monitors are not included.

4 X BETTER THAN 8X CD-ROM!

APS CD CHANGER $299.95



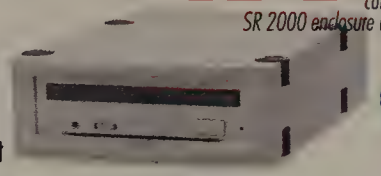
- ✔ Quadruples your CD-ROM storage capacity
- ✔ Space-saving half-height design
- ✔ Direct loading mechanism eliminates trays and caddies

Meet your needs for larger CD-ROM storage capacity with the new APS CD Changer. It is a four-disk CD-ROM changer which operates at 8X speeds, making it an excellent match with high-end multimedia and data archiving applications. The APS CD Changer incorporates a half-height mechanism which switches discs at the click of a mouse and uses a safe, trayless loading and unloading design.

INCREDIBLE CD-RECORDER VALUE!

APS 2X6 CD-R $499.95*

External configuration SR 2000 enclosure as pictured



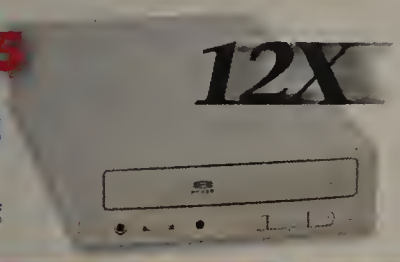
- ✔ 2X record, 6X read mechanism
- ✔ Create multimedia CDs or backups
- ✔ Run CD-ROM applications and games
- ✔ Choice of TOAST, Discribe or Retrospect

Use the APS CD-R to record multimedia CDs and backups at 2X speeds and to access your application and data CDs at up to 6X speeds. Supporting all recording methods in the Orange Book Part II, including disk-at-once, multisession and packet recording, the drive is compatible with Retrospect for use as a backup device. The drive comes with cables, a caddy and your choice of TOAST, Discribe or Retrospect.

GREAT PRICE

$179.95 YOUR CHOICE internal or external*

*External configuration comes in slimline enclosure and does not include DaTerm®



FORGET 4X, SKIP THE 6X!

APS CD12

- ✔ High performance 12X CD-ROM drive
- ✔ Great for home and office CD-ROM use

The 12X performance of the new APS CD12 supercharges any CD-ROM application! Its speed enhances multimedia AND business CDs. At this incredibly low price, you can hardly afford to live with that old 2x or 4x CD-ROM drive.

APS QIC & DAT BACKUP SYSTEMS

Model	Capacity/Awards	Internal	SR2000
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APS HyperDAT® DDS-2 DC	8GB	849.95	899.95
APS HyperDAT® Pro DDS-2 DC	8GB	949.95	999.95
APS HyperDAT® III DDS-3 DC	8GB	1249.95	1299.95

APS MO DRIVES

Model	Capacity/Features	SR1000	SR2000
APS 230 MO	Up to 217MB	$299.95	$379.95
APS 640 MO	640MB		599.95
APS 2.6GB MO	4MB cache		1699.95

APS REMOVABLE DRIVES

Model	Capacity/Awards	SR 1000	SR 2000
APS M540 (with 1 cartridges)		N/A	299.95
APS Jaz (with a cartridge)	1GB	$499.95	499.95
APS Jaz (with 3 cartridges)	1GB	599.95	599.95

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- Resolution up to 1280 x 1024
- Supports QuickDraw 3D RAVE
- Up to 6x faster than a Power Mac 9500 using QuickDraw 3D
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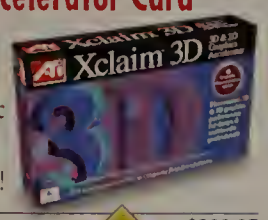

106634	4MB	$329.95
106635	8MB	449.95

NEW FROM APS

APS CD-ROM DRIVES

Model	Capacity/Awards	External
APS CD12	12X CD-ROM in Slimline case	$179.95
APS CD12 Pro	12X CD-ROM in SR 2000 case	279.95
APS PD4	4X CD-ROM/Optical	479.95
APS CD Changer	8X 4 Disc CD changer	299.95
APS CD-R Plus	2X record/6X read CD-R	499.95
APS CD-R Pro	4X4 performance CD-R in Pro Case	999.95
Retrospect	CD-R drop in driver (with drive purchase)	49.95

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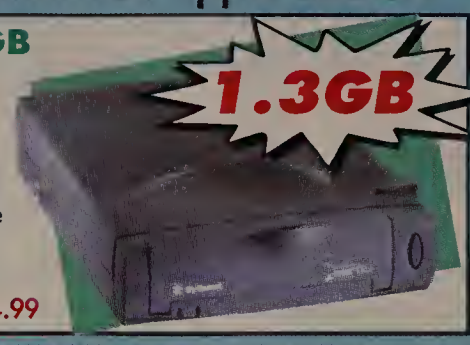
External Hard Drive with Removable Disk Cartridge
•1.3GB capacity per cartridge for virtually limitless, flexible storage •Less than 12ms average seek time •Auto eject button •Small and lightweight design •Connects via SCSI port •Includes one syjet cartridge

$499.99 (SYQ SYJET1SE-09)

•Spare single syjet cartridge...(SYQ SYJET-005)..... $124.99



iomega Zip Drive

iomega Zip Drive
100MB SCSI Drive
•Works like a hard drive •Unlimited storage an inexpensive 100MB disks •Comes with SCSI cable and one 100MB removable disk •For Mac and PC desktops that require SCSI

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(BER ZIP100SCSI)
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Global Village TelePort Platinum™
33.6Kbps Data/Fax Modem
•Send and receive data at up to 33,600 bps •Fax in background as you work •V.34 data compression for fast throughput up to 115.2Kbps •Flash ROM upgradable •Comes with GlobalFax™, GlobalFax™ OCR and data communications software for System 7 and later •For Macintosh desktops

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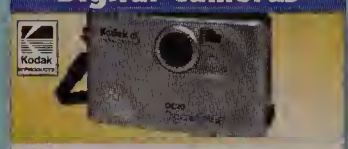

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Digital Science™ Camera
•Records photographic images in digital memory, then images are down-loaded to computer •Shirt-pocket size •1MB storage •24-bit color •Focus-free lens with auto exposure •20-inch to infinity focus distance •Comes with software for Macintosh and PC

$199.99 (KOD DC20)

Connectix Color QuickCam
(CNM CQCM) $199.99

Kodak Digital Camera 50
(KOD DC50) $899.99

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Motorola Montana
PCMCIA 28.8 Fax/Modem
•28.8 (V.34) modem and 14.4 fax •Paging and cellular compatibility •For Apple PowerBook 1400 series

$199.99 (MOT PCMCMONTMAC)

Global Village PowerPort Platinum 28.8/14.4 PCMCIA Modem
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Global Village PowerPort Platinum Pro 28.8/14.4 w/ 10Base-T Connector
(GLV POWRPLTPRO) $449.99

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U.S.Robotics Sportster® /Speakerphone
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SyQuest EZ-Flyer

SyQuest EZ230
EZ-Flyer Removable 230MB SCSI Drive
•230MB capacity per disk •13.5ms average access time •2.4MB/sec. maximum data transfer •Includes one 230MB cartridge, SCSI cable, and power supply

$294.99 regular price
$239.99 after $55 mail-in rebate
(SYQ EZ230EXTMAC)
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SyQuest 230MB 10-Pack (Formatted)
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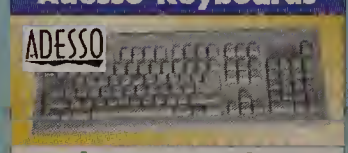
$579.99 (EPS ES1000C-MAC)

Visioneer PaperPort VX Scanner
(VIR PAPERVXMAC) $279.99

Minolta Quick-Scan35 Film Scanner
(MIN QSCAN35MAC) $999.99

Epson Expression 636 Artist Scanner
(EPS 636-AMAC) $1399.99

Adesso Keyboards



Adesso AEK-305
Soft Touch Plus Extended Keyboard
•105 silent, high quality, full stroke mechanical keyswitches •2 extra ADB ports •Keyboard-length wrist pod •One-year warranty

$44.99 (AED AEK-305)

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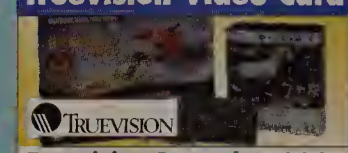

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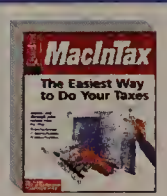

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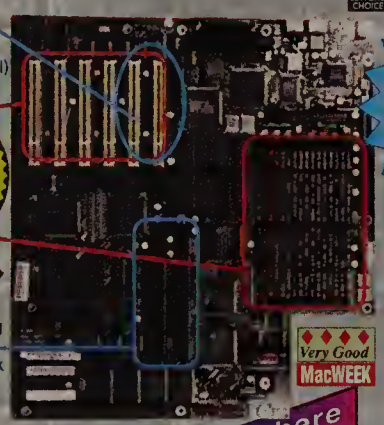

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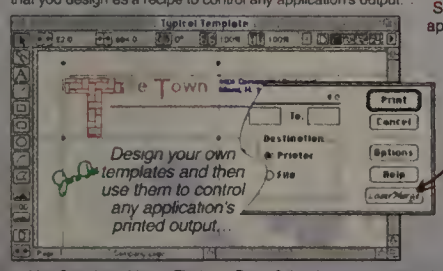

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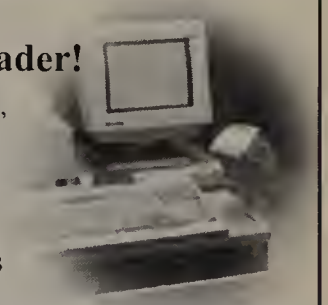

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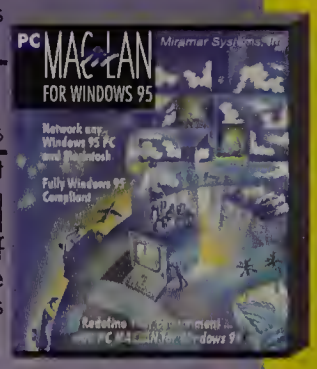

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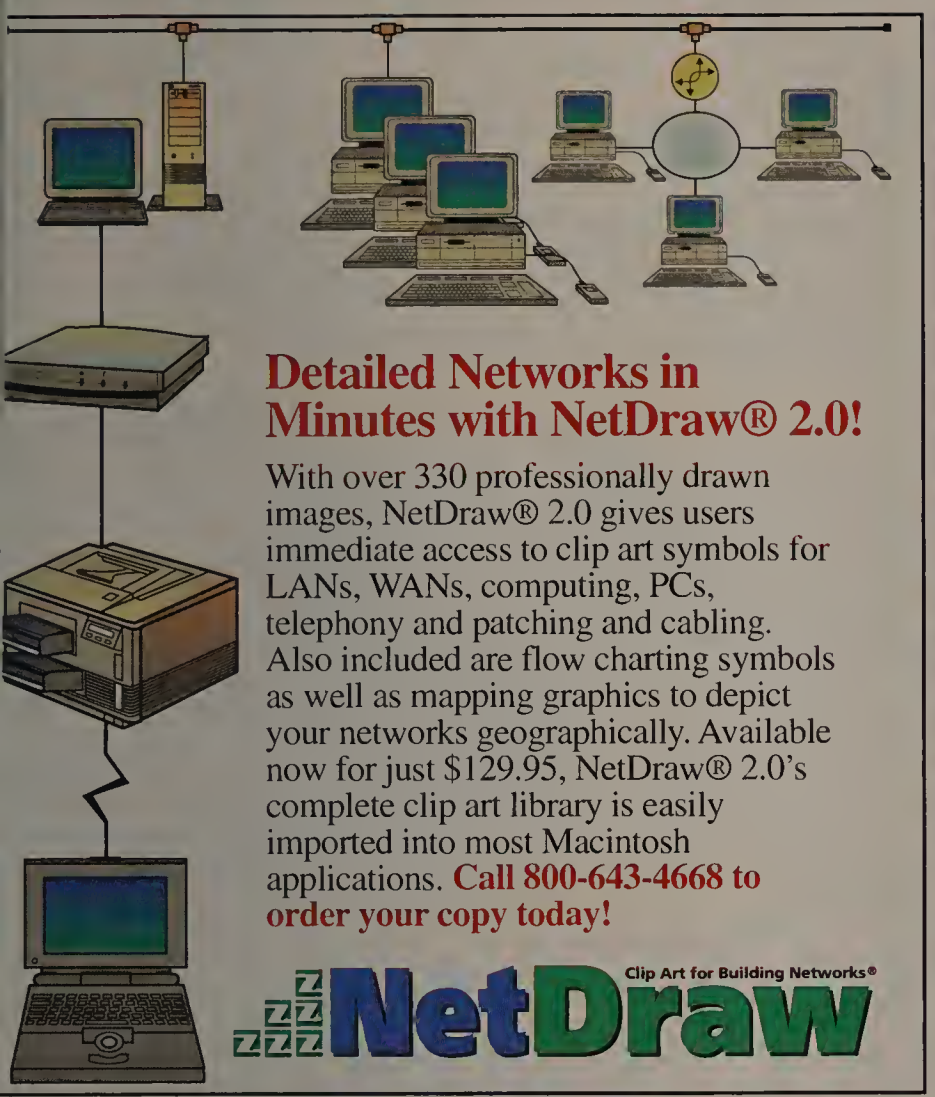

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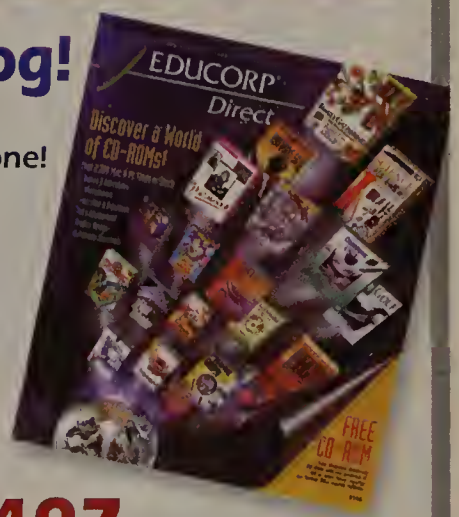

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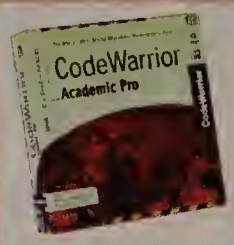

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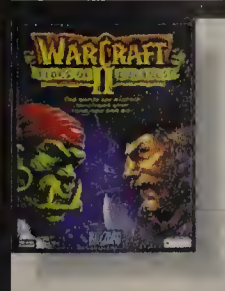

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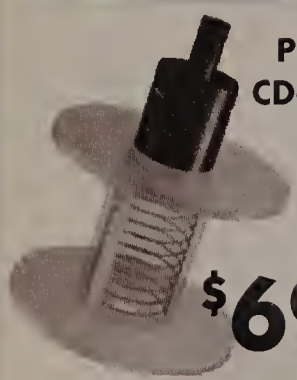

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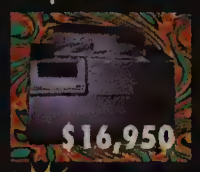

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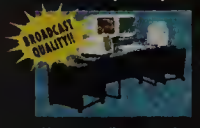

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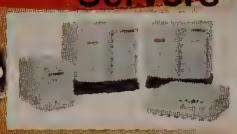

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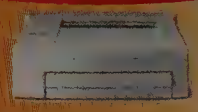

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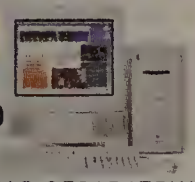

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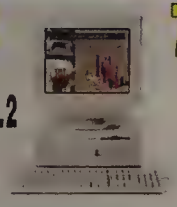

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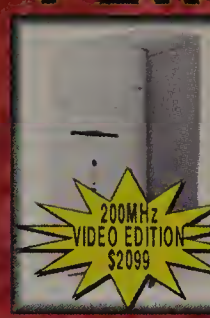

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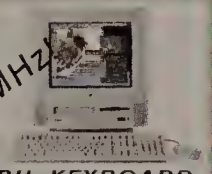

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Apple CD600I

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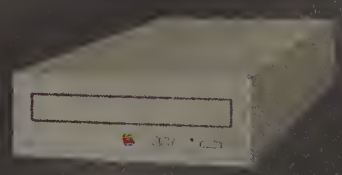

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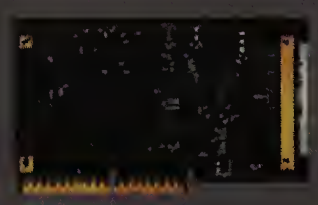

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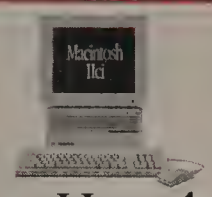

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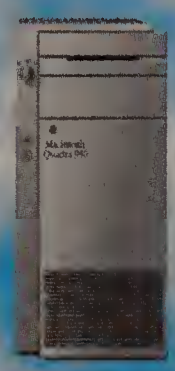

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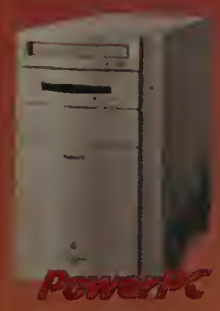

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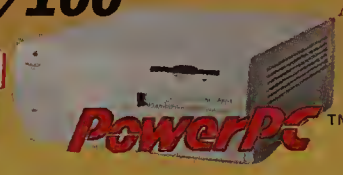

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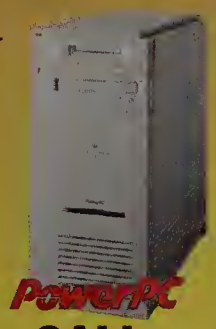

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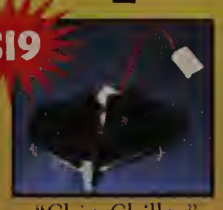

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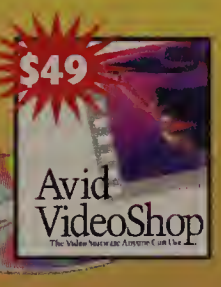

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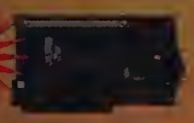

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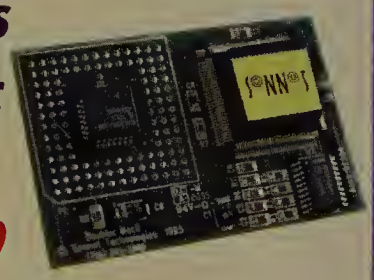

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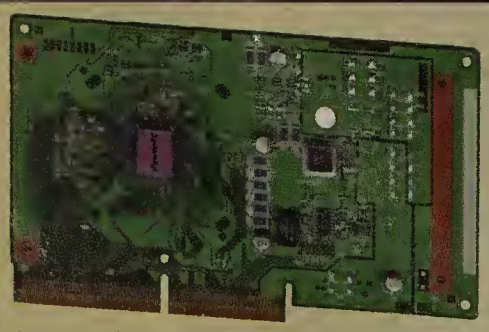

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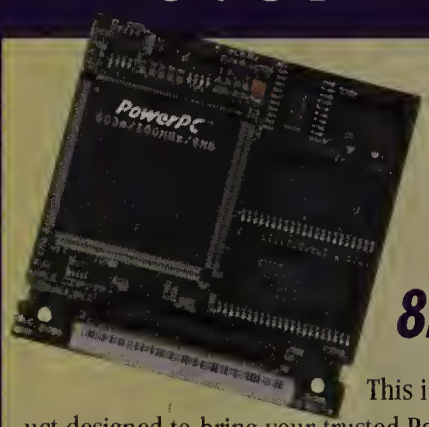

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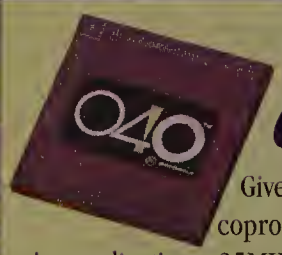

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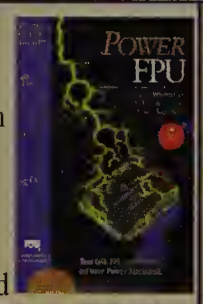

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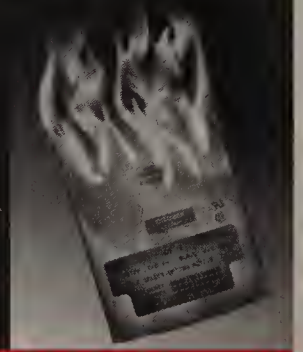

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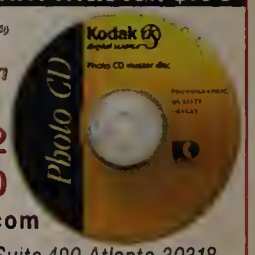

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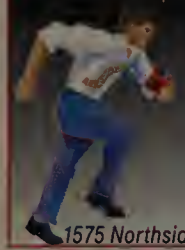

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98.7% Page 1

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Apps Server

Checking: R

DATE	NUMBER	DESCRIPTION / CATEGORY	MEMO
12/12 1996		Opening Balance (Checking)	
12/12 1996	1001	Rent	
12/12 1996		Car Payment	
12/12 1996			

Record | Restore | SPLITS

Net Worth Graph

Monthly Assets, Liabilities and Net Worth

$ in 1,000.00

Income and Expense Graph

Monthly Income and Expenses
4/1/96 - 11/30/96

$ in 1,000.00

10 8 6 4 2 0

4/96 5/96 6/96 7/96 8/96 9/96 10/96 11/96

Net Savings and Expense Comparison
as a Percentage of Total Income

Dining 4.22
Utilities 3.43
Insurance 2.91
Miscellaneous 2.90
Other 3.84
Sub-Total $42,080.55

checking: Write Checks

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Seven hundred fifty and 00/100********** DOLLARS

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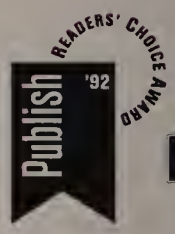

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